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**Area Source Emission Inventory for
AQMP (Air Quality Maintenance Plans)
Development in New Hampshire**

Abcor, Inc, Wilmington, Mass Walden Research Div

Prepared for

Environmental Protection Agency, Boston Air and Hazardous Materials Div

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Area Source Emission Inventory for AQMP Development in New Hampshire

December 1977

Final Report



**U.S. Environmental Protection Agency
Region I
Air and Hazardous Materials Division
Boston, Massachusetts 02203**

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AQMP DEVELOPMENT IN NEW HAMPSHIRE

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I. INTRODUCTION

On May 31, 1972, the Administrator of the Environmental Protection Agency (EPA) published his initial approvals and disapprovals of state implementation plans submitted pursuant to Section 110 of the Clean Air Act as amended in 1970. Challenges to these approvals included contention that approved plans were inadequate to insure maintenance of the air quality standards (National Resource Defense Council vs EPA, 475 F 2nd 968, January 31, 1973). A subsequent measure, taken by the Administrator on June 18, 1973, involved promulgation of regulations requiring states to conduct a comprehensive growth analysis of those areas which have the potential of exceeding any national ambient air quality standards (NAAQS) over the next ten years.

Key elements in the development of an air quality maintenance plan are emission inventories for each analysis year since these provide a practical basis for designing limitation, reduction and redistribution plans. Walden Division of Abcor Inc., was retained by EPA Region I to develop a calendar year 1975 inventory of area source emissions for criteria pollutants in New Hampshire for each county in the state. A projection of these emissions to the year 1985 and gridding of the four southeastern counties was also performed.

Chapter II of this report contains a detailed summary of the methodology employed by Walden for the estimation of the area source emission inventory. Chapter III presents the emissions calculation methodology, Chapter IV the gridding methodology and Chapter V the projection techniques and factors. A summary of results is contained in Chapter VI. Finally, separate data supplement to this report has been prepared consisting of:

- County fuel use and miscellaneous emission source activity for 1975 and 1985 in NEDS area source format.
- Gridded 1975 and 1985 inventory of SO₂ and TSP emissions for the counties of Rockingham, Hillsborough, Stratford, and Merrimack plus the town of Berlin.

II. COUNTY APPORTIONMENT METHODOLOGY

This section describes the methodologies that were employed to produce a county inventory of area source emissions in the State of New Hampshire for the calendar year 1975. The inventory was prepared for EPA Region I and the State of New Hampshire to facilitate development of Air Quality Maintenance Plans for the state.

A. BASIS OF METHODOLOGY

All fuel consumption can be broadly categorized as that by stationary sources and that by non-stationary (transportation) sources. The latter category comprises all modes of combustion-power transportation, including automobiles, buses, trucks, vessels, and aircraft. Stationary sources may also be classified into different user categories and types of use. The major categories of source types include domestic (residential), commercial, institutional, manufacturing, and steam-electric utilities. Most of these can be further classified as point sources which represent individual establishment using very large quantities of fuel, as distinguished from area sources which represent, collectively, a large number of smaller sources distributed over the survey area. In addition, certain types of activity which also produce air pollutants, such as the marketing of gasoline, the use of solvents, agricultural tilling operations, travel on unpaved surfaces, and structure fires are included as area sources.

The methodology used to prepare the county area source inventory is based on the Guide for Compiling a Comprehensive Emission Inventory [1] and Volume 7 of the Guidelines for Air Quality Maintenance Planning and Analysis [2], modified by techniques developed previously by Walden for the EPA [3,4]. The methodology used for emissions from stationary fuel combustion was:

- Assemble total statewide fuel consumption from published sources, and state records,
- Subtract point source fuel consumption from the state totals,
- Assemble various demographic and economic indicator variables for each county,

- Subtract the employment at point sources from the total employment of each county,
- Allocate the remaining statewide fuel consumption (viz., state area source fuel consumption) to counties by various demographic and economic indicators (e.g., county area source employment).

Appropriate methodologies were applied to other emission sources such as incineration, motor vehicles, railroads, etc. as described in the following sections.

B. DATA BASES

Development of the county area source emissions inventory required collection of published data supplemented with information collected by the New Hampshire Air Pollution Control Agency (NHAPCA).

1. Fuel Use

The NHAPCA provided information on total fuel oil use in the state by fuel grade with a partial breakdown by county. In addition, statewide point source fuel use and employment by county were provided for all sources emitting greater than 100 tons per year of a pollutant and for 25 tons or greater sources in Rockingham, Hillsborough, Merrimack, and Stratford counties. Statewide usage of coal, natural gas, and gasoline were obtained from the Bureau of Mines [9,10,11], and consumption of wood from a state advocate association [40].

2. Demographic Data

Information used for allocation of fuel use to counties and for estimation of emission-producing activity not directly related to fuel combustion (e.g. construction fugitive emissions) was collected from published sources. Among these sources are the U.S. Census Bureau [41], and the U.S. Environmental Protection Agency [31].

3. Limitations

Data on point source emissions of solvents was unavailable in sufficient detail for use in this study. Hence, total solvent usage is reported rather than area source emissions.

C. STATIONARY SOURCE FUEL CONSUMPTION ALLOCATION

1. Residential Fuel Consumption

a. Bituminous and Anthracite Coal

Total county residential consumption of anthracite coal* is calculated [4] using the formula

$$C = 0.00387 * U_{\text{coal}} * \exp \left(7.64 - \frac{1000}{D} \right)$$

where

C = County consumption of coal

U_{coal} = Number of occupied dwelling units in the county using coal for space heating [6]

D = Annual degree days for the county [5]

The numeric constants were derived by means of regression analysis [4].

The final county residential area source coal consumption is summed over the state. These state totals are subtracted from the corresponding statewide retail consumption. The remainder, if any, is the state commercial coal consumption, to be allocated according to the commercial coal methodologies.

b. Fuel Oil

Countywide use of residential distillate oil is calculated by means of the formula derived via regression analysis [3]:

$$\text{Residential distillate oil use (gallons)} = [(0.01288 \times \text{degree-days} + 30.41 \times \text{average rooms per housing unit} - 79.54) / 0.14] \times (\# \text{ of housing units})$$

Residential use of residual oil is assumed to be negligible.

* There was no retail bituminous coal consumption in the state in 1975 [8].

c. Natural Gas and Liquified Petroleum Gas (LPG)

Consumption of residential natural gas reported in the NEDS area source data is actually the combined total of natural gas and LPG. However, separate methodologies were developed for these two fuels. The results of the LPG methodology are, therefore, converted to a natural gas equivalent and added to the natural gas consumption value.

County natural gas consumption by residential sources is calculated by means of the regression formula [4]:

$$T_g = 47.5 * U_g * D^{0.367} * \left(\frac{U_{gh}}{U_x} \right)^{0.588} * R_d^{0.125}$$

where

- T_g = County consumption of natural gas (therms)
- D = Annual degree days for the county [5]
- U_g = Number of occupied dwelling units in the county using gas [6]
- U_{gh} = Number of occupied dwelling units in the county using gas for space heating [6]
- U_x = Larger of the number of occupied dwelling units in the county using gas for cooking or hot water [6]
- R_d = Median number of rooms per dwelling unit in the county (in tenths) [6]

This estimate is then normalized against the reported state consumption [36].

County LPG consumption by residential sources is calculated using the formula

$$T_L = (376 + 0.209D) * U_L + \bar{c}_w * U_{LW} + \bar{c}_r * U_{Lr}$$

where

- T_L = County consumption of LPG by residential sources (therms)
- D = Annual degree days for the county [5]
- U_L = Total dwelling units in the county using LPG [6]
- $\bar{c}_w$ = Regional average water heater consumption (therms) [9]
- U_{LW} = Number of dwelling units in the county using LPG for heating water [6]
- $\bar{c}_r$ = Regional average cooking range consumption (therms) [9]
- U_{Lr} = Number of dwelling units in the county using LPG for cooking [6]

The numeric constants resulted from a regression analysis [4]. No sources report state residential LPG consumption. However, retail (commercial and residential combined) figures are published [10]. State commercial point source LPG consumption is subtracted from the published state retail total, yielding state retail area source LPG consumption. The computed county figures (T_c) are converted to kilogallons and summed over the state.

If the estimated state residential LPG consumption exceeds the state retail area source LPG consumption figure, the county consumption figures are normalized against the state retail area source value. Otherwise, the county LPG consumption estimate is left unchanged, and the remainder of the state area source retail LPG is used by the allocation methodology for commercial LPG consumption.

The total gas equivalent is computed by converting the final county residential LPG consumption estimate to a natural gas equivalent* and adding that value to the normalized county natural gas consumption.

d. Residential Wood

Residential consumption of wood was allocated to counties based on county rural population [1].

2. Commercial-Institutional Fuel Consumption

Commercial-Institutional fuel consumption is computed according to two methodologies, one for fuel oil and one for coal and natural gas.

a. Fuel Oil

The calculation of state commercial fuel oil is based on New Hampshire and Bureau of Mines data [11], and data derived by Walden as summarized below:

- Commercial distillate oil = $[a * (\text{distillate oil used for heating} - \text{residential distillate oil})] + \text{distillate oil for military use}$
- Commercial residual oil = $[a * \text{residual oil used for heating}] + \text{residual oil for military use}$

* 92.2 gallons LPG per 10^6 ft³ of natural gas.

**a is a commercial fraction based on commercial employment; b is an industrial fraction based on manufacturing employment $a + b = 1$

County-wide distribution of commercial distillate and residual oil is based on the following steps:

(1) Step One. Calculation of fuel used in each county by hospitals, hotels, schools, colleges, and laundries, based on correlative relationships between fuel use and employment [3].

(2) Step Two. Determination of the fractions of this fuel use attributable to distillate and residual oil based on the fuel use patterns in the state [3].

(3) Step Three. Calculation of distillate and residual oil consumed by housing units using oil in structures of 20 units or more in each county. It was assumed that units in structures of more than 50 units consumed residual oil and that all other residential units included under the commercial category consumed distillate oil [3].

(4) Step Four. Subtraction of the oil totals for the above six subcategories from the state totals for commercial distillate and residual oil use.

(5) Step Five. Subtraction of the employment totals for the categories mentioned under Step 1 from the respective county and state employment totals.

(6) Step Six. Allocation of the remaining state fuel oil figures by means of the adjusted county and state employment figures.

(7) Step Seven. Addition of the oil used by the six subcategories to the county oil figures obtained in Step 6.

b. Coal, natural gas, and LPG

The methodology for determining county fuel consumption of natural gas and LPG by commercial and institutional area sources is performed in five stages. There was no remaining consumption of coal to be allocated to commercial use after allocation to the residential sector.

(1) County Energy Consumption by Selected Subcategories.

Energy consumption is calculated for each of five commercial-institutional subcategories using the following formulae:

$$T_1 = 126.5 * BEDS + 12.7 * D + 77.4 * E_1 - 5.72 \times 10^4$$

$$T_2 = 8.05 \times 10^{-17} R_0^{1.84} D^{3.99} (R_0 + 2.84 * (R - R_0))$$

$$T_3 = 165 E_3 + 4.10 * D - 1.82 \times 10^4$$

$$T_4 = 229 E_4 + 51.5 * D - 2.94 \times 10^5$$

$$T_5 = 53 E_5 - 1.28 \times 10^4$$

where

T_1 = Total energy consumed in the county by hospitals
(10^3 therms)

T_2 = Total energy consumed in the county by hotels
(10^3 therms)

T_3 = Total energy consumed in the county by schools
(10^3 therms)

T_4 = Total energy consumed in the county by universities
(10^3 therms)

T_5 = Total energy consumed in the county by commercial
laundries (10^3 therms)

D = Annual degree days for the county [5]

BEDS = Number of hospital beds in the county [12]

R = Number of hotel rooms in the county [13]

$R_0 = 100$ if $R > 100$

or $R_0 = R$ if $R \leq 100$

E_1 = County hospital employment

E_3 = County school employment

E_4 = County university employment

E_5 = County commercial laundry employment

The equation for T_1 were computed via regression analysis [4].

Total consumption in the county by the five commercial subcategories (T_c) is then computed through summation.

(2) State Energy Consumption by Fuel Type for Selected Subcategories. The estimated energy consumption for the five commercial subcategories is summed over all counties in the state. This state total

is broken down into natural gas, and LPG consumption according to the proportion of occupied residential dwelling units in the state using those respective fuels for space heating [4]:

Letting U_i = the number of occupied dwelling units heated by fuel type i (0 = fuel oil, 1 = natural gas, 2 = LPG, 3 = coal)

X_i = published or derived state commercial area source consumption of fuel type i ,

$$T_s = \sum_c T_c$$

and

$$U = U_0 + \sum_{i=1}^3 (U_i : X_i > 0)$$

then

$$T_{i,s} = T_s \frac{U_i}{U}$$

where

$T_{i,s}$ = State consumption of fuel type i by five commercial subcategories (10^3 therms)

Dwelling units using fuel oil for space heating are included in the dwelling unit total to account for fuel oil consumed by commercial sources in the fuel consumption total.

(3) Other State Commercial Consumption. The state commercial subcategory consumption for each fuel type is converted from therms to the standard NEDS units for that fuel type (10^6 cu.ft. for natural gas, 10^3 gal. for LPG) by

$$F_1 = 9.69 \times 10^{-5} T_1$$

$$F_2 = 1.05 \times 10^{-3} T_2$$

where

F_i = State consumption of fuel type i by the five commercial subcategories in the standard NEDS units of that fuel type ($i = 1$ for natural gas, $i = 2$ for LPG)

9.69×10^{-5} = Factor to convert therms to 10^6 cu.ft. of natural gas

1.05×10^{-3} = Factor to convert therms to 10^3 gal. of LPG

There is no commercial area source consumption of coal.

(4) Other State Consumption by Fuel Type. Next, state consumption of each fuel type by all commercial sources other than the five subcategories are computed. Normalization factors are also computed.

Actual state commercial area source consumption of each fuel type is derived directly from published values. State commercial area source natural gas is the total commercial natural gas consumption less the commercial point source natural gas consumption. State consumption of LPG, anthracite coal, and bituminous coal are the remainder of state retail fuel consumption after subtracting state commercial point source consumption and normalized state residential consumption for the respective fuel types.

State fuel consumption of all commercial sources other than the five commercial subcategories is calculated as follows:

If $X_i > F_i$, then $FO_i = X_i - F_i$ and $n_i = 1$

If $X_i \leq F_i$, then $FO_i = 0$ and $n_i = \frac{X_i}{F_i}$

where

FO_i = State consumption by "other" commercial sources of fuel type i

X_i = Actual state commercial area source consumption of fuel type i

F_i = Calculated state five commercial subcategory consumption of fuel type i

n_i = Normalization factor for consumption of fuel type i by five commercial subcategories

(5) Total County Commercial Consumption. Finally, the county commercial consumption is calculated:

$$F_{i,c} = n_i f_i T_{i,c} \left(\frac{U_{i,c}}{U_c} \right) + FO_i \frac{E_c}{E_s}$$

where

$F_{i,c}$ = Normalized county consumption of fuel type i by commercial area source (in the standard NEDS units of fuel type i)

n_i = Normalization factor for consumption of fuel type i by the five commercial subcategories

f_i = Factor to convert consumption from therms to the NEDS standard units for fuel type i

$T_{i,c}$ = Total county fuel consumption by the five commercial subcategories (therms)

$U_{i,c}$ = Number of occupied dwelling units in county c using fuel type i for space heating [6]

$$U_c = \sum_{i=1}^4 (U_{i,c} : T_i > 0) + U_{0,c}$$

U_c = total number of dwelling units in the county using fuels for space heating that are also used by commercial sources. This includes dwelling units using fuel oil ($U_{0,c}$).

FO_i = State consumption of fuel type i by all commercial sources except the five subcategories

E_c = County area source employment for all commercial sources except the five subcategories

E_s = State area source employment for all commercial sources except the five subcategories

3. Fuel Consumption by Industrial Sources

The procedure for estimating fuel oil, natural gas and bituminous coal consumption by industrial area sources involves four steps. Essentially all anthracite coal consumed by industry is by point sources, so no allocation is performed for that fuel type. Industrial consumption of LPG is not estimated separately, but is combined with the state natural gas total prior to apportionment to the county level.

a. Fuel Intensity Ratios

State fuel intensity ratios are computed for each fuel type by each of SIC categories 20-39 (in this study, SIC category 39 will represent the combination of SIC 39 and SIC 19), using the 1972 Census of Manufacturers fuel use data [14] and employment data for the corresponding year from the County Business Patterns (CBP) [15].

$$FIR_{ij} = F_{ij}/E_j$$

where

FIR_{ij} = The fuel intensity ratio for fuel type i and SIC category j

F_{ij} = State consumption of fuel type i by SIC category [14]

E_j = State employment of SIC category j [15]

b. County Fuel Consumption

The fuel intensity ratios give a measure of fuel use intensity per employee. By applying the state fuel intensity ratios to corresponding county area source employment figures, and summing over the 20 SIC categories, an estimate of county industrial fuel consumption is obtained:

$$F_{i,c} = \sum_{j=1}^{20} E_{j,c} FIR_{ij}$$

where

$F_{i,c}$ = County industrial area source consumption of fuel type i

$E_{j,c}$ = Total employment in county c for SIC j minus point source employment in county c for SIC j [16]

FIR_{ij} = State fuel intensity ratio for fuel type i and SIC category j

c. Area Source Consumption

Actual state industrial area source consumption of natural gas (including LPG) and bituminous coal are derived from state totals and point source consumption figures as follows:

$$X_1 = (G - G_p) + f(L - L_p)$$

and

$$X_2 = (B_s - B_p)$$

where

- X_1 = Statewide total gas equivalent consumption by industrial area sources
- X_2 = Statewide consumption of bituminous coal by industrial area sources
- G = Total state industrial natural gas sales [9].
- G_p = Statewide natural gas consumption by industrial point sources [16]
- L = Total state industrial LPG sales [10]
- L_p = Statewide LPG consumption by industrial point sources [16]
- f = Factor to convert LPG to natural gas equivalent (0.0922)
- B_s = Published state shipments of bituminous coal for industrial consumption [8]
- B_p = Statewide consumption of bituminous coal by industrial point sources [16]

d. County Estimates

County industrial area source fuel consumption estimates are normalized against the actual state consumption:

$$F'_{i,c} = F_{i,c} \left(\frac{X_i}{F_i} \right)$$

where

- $F'_{i,c}$ = Normalized county industrial area source consumption of fuel type i
- $F_{i,c}$ = Estimated county industrial area source consumption of fuel type i
- $F_i = \sum_c F_{i,c}$
- X_i = Actual state industrial area source consumption of fuel type i

Industrial area source consumption of coke, and process gas is assumed to be negligible.

4. Incineration and Open Burning

Estimates of incineration by county were obtained from the NHAPCA [16].

D. MOBILE SOURCE FUEL CONSUMPTION ALLOCATION

1. Highway Mobile Sources

a. State Totals

(1) Heavy Duty Gasoline-powered Vehicles - Heavy duty vehicles (HDV) are defined as all vehicles weighing more than 6,000 lbs. gross weight. Four subcategories are considered in these calculations:

HDV₁: 6,001 - 10,000 lbs.

HDV₂: 10,001 - 20,000 lbs.

HDV₃: 20,001 - 26,000 lbs.

HDV₄: Greater than 26,000 lbs.

Statewide HDV gasoline use is calculated as follows:

$$\text{HDV gasoline use} = \left[\sum_{i=1}^{i=4} (\text{HDV}_i \times \text{average miles}_i / \text{miles per gallon}_i) + (\text{commercial buses} \times \text{average gallons/bus}) + (\text{school buses} \times \text{average gallons/bus}) \right] - [\text{diesel and butane use}]$$

HDV diesel use by state is reported by the Federal Highway Administration [17].

(2) Light Duty Vehicles. It is assumed that only a negligible number of light-duty vehicles use diesel. Light duty gasoline is calculated from total gasoline sales [17] by

$$\text{LDV gasoline use} = \text{total gasoline sales} - \text{HDV gasoline}$$

b. County Allocation of Highway Mobile Source Gasoline and Diesel.

(1) Heavy-Duty Vehicle. County use of diesel by HDV's is obtained by using county truck registrations [18] as the apportioning factors to be applied to the state (I) totals,

$$\text{Diesel HDV}_{\text{county } i} = \frac{\text{trucks} > 6000 \text{ lb}_i}{\text{trucks} > 6000 \text{ lb}_1} \times \text{diesel HDV}$$

In order to determine county use of gasoline for HDV's the following calculation is performed:

$$\begin{aligned}
 (\text{gasoline HDV})_{\text{county } i} &= \sum_{j=1}^{j=4} \text{HDV}_j \times \text{avg. miles}_{j(i)} / \text{MPG}_{j(i)} \\
 + \frac{\text{population (census yr)}_i}{\text{population (census yr)}_I} &\times (\text{commercial buses}_I \times 7276 \\
 &\text{gallons/bus}) \\
 + \frac{\text{population (census yr)}_i}{\text{population (census yr)}_I} &\times (\text{institutional buses}_I \times 1058) \\
 - \frac{\text{trucks}_i}{\text{trucks}_I} &\times (\text{diesel and butane})_I
 \end{aligned}$$

(2) Light Duty Vehicle (LDV). The method employed for county allocation of gasoline used by LDV's is to use vehicle miles as the distributive factor in the form:

$$\begin{aligned}
 \text{gasoline LDV}_{\text{county } i} &= \frac{\text{vehicle miles}_i}{\text{vehicle miles}_I} \times \text{total gasoline}_I \\
 &- \text{gasoline HDV}_i
 \end{aligned}$$

2. Consumption of Gasoline and Diesel Fuel by Off-Highway Sources

Off-highway sources have been divided into six categories: farm equipment, construction equipment, industrial equipment, motor vehicles, lawn and garden equipment, and snowmobiles. Consumption in each category is estimated by either of two general approaches;

- Apportionment of a national fuel consumption total to counties on the basis of employment, population, etc., or
- Calculation of county or state totals by applying fuel consumption rates to average usage figures and equipment populations.

Total off-highway consumption of gasoline and diesel fuel is the sum of the consumption estimates of the individual categories as follows:

$$G = \sum_{j=1}^6 F_{1,j}$$

$$DF = \sum_{j=1}^3 F_{2,j}$$

where

G = Off-highway consumption of gasoline (10^3 gal.)

DF = Off-highway consumption of diesel fuel (10^3 gal.)

F_{ij} = Consumption of fuel type i (i = 1 for gasoline, i = 2 for diesel fuel) by off-highway category j (j = 1 for farm equipment, j = 2 for construction equipment, j = 3 for industrial equipment, j = 4 for motorcycles, j = 5 for lawn and garden equipment, and j = 6 for snowmobiles)

A description of the methodologies for estimation of fuel consumed by each off-highway category follows.

a. Farm Equipment

Consumption of gasoline and diesel fuel by farm equipment is apportioned to individual counties from an estimated state farm equipment consumption on the basis of tractor population. To estimate state fuel consumption by farm equipment, consumption values are calculated separately for each of five equipment subcategories: farm tractors, combines, motorized balers, forage harvesters, and general-purpose large utility engines. The methodology for estimating state fuel consumption by farm equipment is expressed as:

$$F_{s,i} = \sum_{j=1}^5 f_{ij} N_j A_{ij} FR_{ij}$$

where

$F_{s,i}$ = State consumption of fuel i (i=1 for gasoline i=2 for diesel fuel) by farm equipment (gal.)

f_{ij} = Fraction of farm equipment subcategory j in the state that is powered by fuel type i (j=1 for tractors j=2 for combines, j=3 for motorized balers, j=4 for forage harvesters, j=5 for general-purpose large utility engines) [19]

- N_j = State population of farm equipment in subcategory j [20]
 A_{ij} = Average annual usage of equipment in subcategory j
 usage fuel type i (hours/year) [19]
 FR_{ij} = Average hourly consumption of fuel type i per unit of
 equipment in subcategory j (gals/hour) [19]

With the exception of the general-purpose large utility engine category, equipment populations are obtained from the Census of Agriculture [20]. The utility engine population is estimated from the distribution of tractor populations in irrigated and non-irrigated areas

$$N_5 = 0.30N_1 \left(\frac{IR}{IR+NIR} \right) + 0.05N_1 \left(\frac{NIR}{IR+NIR} \right)$$

where

- N_1 = Number of tractors in the state
 IR = Number of farms in the state in irrigated areas
 NIR = Number of farms in the state in non-irrigated areas

The estimated large utility engine population is apportioned by fuel type according to the proportion of tractors that are powered by gasoline and diesel fuel.

County consumption of gasoline and diesel fuel by farm equipment is determined by:

$$F_{ij} = F_{s,i} \frac{N_c}{N_1}$$

where

- F_{ij} = County consumption of fuel type i by farm equipment
 $F_{s,i}$ = State consumption of fuel type i by farm equipment
 N_c = County tractor population [21]
 N_1 = State tractor population [20]

b. Construction Equipment

County consumption of gasoline and diesel fuel by construction equipment are allocated from the state construction equipment consumption on the basis of population. State fuel consumption is estimated by apportioning national fuel consumption according to total non-building construction employment (i.e., employment in heavy construction (SIC 1600) and special trade (SIC 1700) categories):

$$F_{i,2} = F_{N,i} \left(\frac{E_s}{E_N} \right) \left(\frac{P_C}{P_S} \right)$$

where

$F_{i,2}$ = County consumption of fuel type i by construction equipment

$F_{N,i}$ = National consumption of fuel type i by construction equipment (gal.) [22]

E_s = State non-building employment [13]

E_N = National non-building employment [15]

P_C = County population [41]

P_S = State population [41]

c. Industrial Equipment

The methodology for estimating consumption of gasoline and diesel fuel by industrial equipment is expressed as:

$$F_{i,3} = F_{N,i} \left(\frac{E_{C,mmw}}{E_{N,mmw}} \right)$$

where

$F_{i,3}$ = County consumption of fuel type i by industrial equipment

$F_{N,i}$ = National consumption of fuel type i by industrial equipment [22]

$E_{C,mmw}$ = Total county employment in manufacturing, mining, and wholesale trade [15]

$E_{N,mmw}$ = Total national employment in manufacturing, mining, and wholesale trade [15]

d. Motorcycles

County gasoline consumption by motorcycles is estimated from state consumption on the basis of population:

$$F_{1,4} = \frac{P_C}{P_S} (M * FR * (f_1 u_1 + f_2 u_2))$$

where

$F_{1,4}$ = County consumption of gasoline by motorcycle (gal.)

P_C = County population [41]

P_S = State motorcycle registrations [23]

M = State motorcycle fuel consumption rate (gal./mile) [22]

FR = Motorcycle fuel consumption rate (gal./mile) [22]

f_1 = Fraction of motorcycles that are off-road [24]

u_1 = Average annual usage of off-road motorcycles (miles/year)

f_2 = Fraction of motorcycles that are combination [24]

u_2 = Average annual usage of combination motorcycles (miles/year) [24]

e. Lawn and Garden Equipment

County lawn and garden equipment consumption of gasoline is derived from national totals of lawn and garden equipment consumption of gasoline and snowthrower consumption of gasoline:

$$F_{1,5} = F_{N,LG} \left(\frac{U1_C}{U1_N} \right) \left(\frac{FFD_C}{FFD_N} \right) + K \cdot F_{N,SN} \left(\frac{P_C}{P_{SZ}} \right) \left(\frac{S_C}{S_{SZ}} \right)$$

where

$F_{1,5}$ = County consumption of gasoline by lawn and garden equipment

$F_{N,LG}$ = National consumption of gasoline by lawn and garden equipment other than snowthrowers (gal.) [22]

$U1_C$ = Number of dwelling units in single-unit structures in the county [6]

$U1_N$ = Number of dwelling units in single-unit structures in the nation

FFD_C = Number of freeze-free days (minimum temperature $> 32^\circ F$) in the county [5]

$FFD_N = \sum_C FFD_C$ for all counties in the nation

$K = \begin{cases} 0 & \text{for counties with annual snowfall} < 30 \text{ inches} \\ 1 & \text{for counties with annual snowfall} > 30 \text{ inches} \end{cases}$

$F_{N,SN}$ = National consumption of gasoline by snowthrowers (gal.) [18]

S_C = County snowfall [5]

$S_{SZ} = \sum_C (S_C : S_C > 30 \text{ inches})$ (snow zone snowfall; the snow zone is all areas with annual snowfall > 30 inches)

P_C = County population [16]

$P_{SZ} = \sum_C (P_C : S_C > 30 \text{ inches})$ (snow zone population)

f. Snowmobiles

County consumption of gasoline by snowmobiles is derived from the national snowmobile gasoline consumption total on the basis of the county's share of the snowmobile population. County snowmobile population is estimated from state snowmobile registrations using one of two formulae [19]. The formulae compute the fraction of state snowmobiles that are located in the county. The formula used is determined by the population density of the county.

For counties with population densities that are less than 1,000 inhabitants per square mile,

$$f_C = 1.56 * \left(\frac{P_C}{P_S} \right) + 0.0321 \left(\frac{S_C}{S_0} \right) - 0.0234$$

For counties with population densities that are greater than or equal to 1,000 inhabitants per square mile,

$$f_C = K \frac{P_C}{P_S} [1.5 - 0.0005 \rho_C]$$

where

f_C = Fraction of state's snowmobiles that are located in county c

P_C = County population [41]

P_S = State population

S_c = County snowfall [5]

S_o = Snowfall at center of the state (centroid county snowfall)

ρ_c = county population density (inhabitants/square mile) [16,25]

$K = 0$ for $\rho_c > 3,000$

$= 1$ for $1,000 \leq \rho_c \leq 3000$

The numeric constants are regression coefficients [4]. The county snowmobile population is then computed:

$$N_{c,sm} = f_c N_{s,sn}$$

where

$N_{c,sm}$ = Number of snowmobiles in county c

$N_{s,sn}$ = State snowmobile registrations [22]

The county consumption of gasoline by snowmobiles is then apportioned from the national snowmobile gasoline consumption total.

$$F_{1,6} = F_{N,sm} \left(\frac{N_{c,sm}}{N_{N,sm}} \right)$$

where

$F_{1,6}$ = County consumption of gasoline by snowmobiles (gal.)

$F_{N,sm}$ = National consumption of gasoline by snowmobiles (gal.) [15]

$N_{c,sm}$ = County snowmobile population

$N_{N,sm}$ = National snowmobile population

3. Consumption of Diesel Fuel by Railroads

There was no reported consumption of diesel fuel by rail locomotives in New Hampshire during 1975 [11].

4. Aircraft Landing and Take-off Cycles

County landing and take off cycles are calculated separately for civil, commercial, and military aircraft categories. One of two methods is used to determine county LT0s.

a. FAA Regulated Airports

For counties with FAA regulated airports and/or military airports, LTOs are derived directly from reported operations:

$$LTO_1 = 0.5 \times O_1$$

where

LTO_1 = County LTOs for aircraft category i ($i = 1$ for commercial aircraft, $i = 2$ for civil aircraft, $i = 3$ for military aircraft)

O_1 = Total operations in county for aircraft category i

b. Non-FAA Regulated Airports

For counties with no FAA regulated airports or military airports, all operations in the county are assumed to involve civil aircraft only. The number of LTOs for civil aircraft is calculated from the county aircraft registrations:

$$LTO_2 = 365 \cdot N$$

where

N = the number of aircraft registered in the county.

5. Consumption of Fuel by Marine Vessels

County marine consumption of gasoline is apportioned from state marine gasoline consumption on the basis of inland water area and coastline:

a. Gasoline

$$G_V = \left(\frac{W_C + f \cdot L_C}{W_S + f \cdot L_S} \right) [10 \cdot m_C (N_{V1} FR_{V1} + N_{V2} FR_{V2})]$$

where

G_V = County consumption of gasoline by marine vessels (gal.)

W_C = County inland water area [25]

W_S = State inland water area [25]

f = Factor for converting coastline to inland water area

L_C = County coastline

L_S = State coastline

m_c = Number of warm months (which promote boating activities) [6]. This is assumed to be the number of months during which the monthly normal temperature exceed 45°F for counties north of 43° latitude, 48°F for counties between 37°F and 43°F latitude, and 55°F for latitude south of 37°F latitude.

N_{v1} = State inboard boat registrations [26]

FR_{v1} = Average fuel consumption rate of inboard boats (gal/hour) [22]

N_{v2} = State outboard boat registrations [27]

FR_{v2} = Average fuel consumption rate of outboard boats (gal/hour) [22]

b. Diesel and Residual Oil

County consumption of diesel fuel and residual oil by vessels is apportioned from state consumption [11] using the procedures specified in Reference [1]. Fuel use in these categories was allocated only to Rockingham County [39].

6. Retail Sales of Gasoline

For states such as New Hampshire that do not report county retail gasoline sales, a methodology has been developed that estimates county sales from reported state retail sales of gasoline, reported state aviation gasoline sales, and computed consumption of gasoline by various off-highway categories:

$$V_c = V_h \left(\frac{r_c}{r_s} \right) + \sum_{j=1}^3 F_{1,j} + V_a \left(\frac{LTO_c}{LTO_s} \right)$$

where

V_c = County retail sales of gasoline (10^3 gal.)

V_h = State retail sales of gasoline for highway and marine use (10^3 gal.)

r_c = Gross receipts of gasoline service stations in the county [28]

r_s = Gross receipts of gasoline service stations in state

$F_{1,j}$ = County consumption of gasoline (10^3 gal.) by off-highway category j ($j = 1$ for farm equipment, $j = 2$ for construction equipment, $j = 3$ for industrial equipment)

$$\begin{aligned}
 V_a &= \text{State aviation gasoline sales (10}^3 \text{ gal.) [17]} \\
 LTO_c &= \text{Total landing - take-off cycles in county for military,} \\
 &\quad \text{civil, and commercial aircraft.} \\
 LTO_s &= \sum_c LTO_c
 \end{aligned}$$

The county consumption of gasoline by off-highway sources is determined using the methodologies described previously.

The state retail sales of gasoline for highway and marine use are derived from the reported state total retail sales by subtracting reported sales for agricultural, commercial, industrial, and aviation off-highway categories:

$$V_h = V_s - \left(\sum_{i=1}^4 V_{OH,i} \right)$$

where

$$\begin{aligned}
 V_h &= \text{State retail sales of gasoline for highway and marine use} \\
 V_s &= \text{Total state retail gasoline sales [23]} \\
 V_{OH,i} &= \text{State retail sales of gasoline for off-highway category} \\
 &\quad i \text{ (i=1 for agricultural, i=2 for commercial, i=3 for} \\
 &\quad \text{industrial, i=4 for aviation completed previously)}
 \end{aligned}$$

E. MISCELLANEOUS EMISSION SOURCE ALLOCATION

1. Consumption of Organic Solvents

The methodology for allocating organic solvent consumption by county consists of apportioned national consumption of seventeen primary solvent groups by major user category according to county population or area source employment for the individual user categories. Total solvent consumption is the sum of the consumption value for each of the user categories. Table 2-1 contains a list of the primary solvent groups and corresponding user categories. Two of the major user categories, surface coatings and other use, are broken down into subcategories as shown in Table 2-1.

National consumption of the primary solvent groups is distributed to each of the user categories according to the percentage of solvent used by the user category:

TABLE 2-1
SOLVENT TYPES AND USER CATEGORIES
User Category (✓ designates solvents used)

User Category (/ designates solvents used)																						
SOLVENT TYPE	Solvent Index	User Index	Surface Coatings												Other Use							
			Population	SIC 7535	SIC 371	SIC 25	SIC 34	SIC 35 & 36	SIC 26	SIC 243	SIC 37 & 244	SIC 37	Less 371, 373	SIC 36	Total Manu- facturing	SIC 373	Degreasing	Dry Cleaning	Printing & Publishing	Rubber & Plastics	Total Manufac- turing	Popula- tion
Special Naphthas	1	J	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Perchloroethylene	2																					
Ethanol	3		/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Trichloroethylene	4																					
Toluene	5		/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Acetone	6		/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Xylene	7		/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Fluorocarbons	8																					
M.E.K.	9		/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1,1,1-Trichloro- ethane	10																					
Methylene Chloride	11		/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Methanol	12																					
Ethylene Dichloride	13		/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Ethyl Acetate	14		/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/

TABLE 2-1 (CONTINUED)

SOLVENT TYPES AND USER CATEGORIES

User Category (✓ designates solvents used)

	Solvent Index	User Index	Surface Coatings											Degreasing	Dry Cleaning	Printing & Publishing	Rubber & Plastics	Other Use		
			Population	SIC 7535	SIC 371	SIC 25	SIC 34	SIC 35 & 36	SIC 26	SIC 243 & 244	SIC 37	Less 371, 373	SIC 36					Total Manufacturing	SIC 373	Total Manufacturing
SOLVENT TYPE	i	j	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Cyclohexane	15		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓		
M.I.B.K.	16		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓
All Other Solvents	17																	✓	✓	✓

$$S_{Nij} = S_i f_{ij}$$

where

S_{Nij} = National consumption (tons) of solvent group 'i' by user category j (Table 2-2 gives the subscript values corresponding to individual solvent groups and user categories).

S_i = Published total national solvent group i [29,30]

f_{ij} = Percent of solvent group i that is consumed by user category j [4]

The county consumption for each solvent group and user category is computed and summed to give the total county consumption:

$$S_c = \sum_{i=1}^{19} \sum_{j=1}^{18} \left(\frac{E_{cj} - P_{cj}}{E_{Nj} - P_{Nj}} \right) S_{Nij}$$

where

S_c = Total county organic solvent consumption (tons)

S_{Nij} = National consumption of solvent type i by user category j (tons) [defined above]

E_{cj} = Number of individuals (employment or population) in county c in user category j [16]

E_{Nj} = Number of individuals in the nation in user category j [15]

P_{cj} = Number of individuals in county c in point source user category j [16]

P_{Nj} = Number of individuals in the nation in point source user category j (NEDS)

2. Unpaved Road (Dirt and Gravel) VMT

Average daily vehicle miles traveled on dirt and gravel roads in each county were supplied by the EPA National Air Data Branch [31].

3. Unpaved Airstrip LTO Cycles

The total number of LTO cycles on unpaved airstrips in each county was calculated by multiplying the total number of aircraft based at unpaved airstrips by 250 [31].

4. Acres of Heavy Construction

Receipts by construction forms at the state level [32] were converted to acres based on the conversion factors presented in Table 2-2 [31]. State construction acreage was apportioned to counties on the basis of construction employment [32].

5. Miscellaneous Wind Erosion

County acreage of land subject to wind erosion was assumed to equal the total cropland of each county [20].

6. Land Tilling

County acreage of land tilling operations was estimated from the harvested cropland in each county. The harvested cropland [20] was multiplied by the estimated number of two annual tillings [31] to compute acreage of land tilling operations.

7. Forest Wildfires, Managed Burning, Agricultural Field Burning, Frost Control

Forest wildfire activity was derived from Forest Service Reports [43]. Activity in the other miscellaneous emission source categories were determined to be insignificant.

8. Structure Fires

The number of structure fires in each county were assumed to be equal to four per thousand population [1].

TABLE 2-2
CONSTRUCTION DOLLARS-TO-ACRES CONVERSION FACTORS

SIC Code	Factor (acres/\$106)
1521	5
1522	5
1531	5
1541	5
1542	5
1611	25
1622	25
1623	5
1629	150

Source: Reference [31]

III. EMISSIONS CALCULATION METHODOLOGY

A. STATIONARY SOURCES

Sulfur and ash levels of oil and coal were provided by the New Hampshire APCA. For most source categories, the procedure for calculation of emissions was [38]:

$$\text{emissions [tons/year)} = \frac{\text{source category activity} \times \text{scale factor} \times \text{emission factor}}{2000}$$

The source activity levels are those values (and units of measurement) coded on the NEDS area source form [1]. The emission factors and scale factors that were employed are shown in Table 3-1. Scale factors convert source activity into units consistent with those of the emission factor.

B: MOBILE SOURCES

Highway source emissions were computed by first estimating the total mileage in each category by assuming the following factors [28]:

Light-duty Gasoline	(LDG)	13.6 miles per gallon
Heavy-duty Gasoline Vehicle	(HDG)	3.4 miles per gallon
Heavy-duty Diesel Vehicle	(HDD)	5.0 miles per gallon

The estimated VMT was then split between urban and rural VMT on the basis of the population density code (i.e., if 20 percent of a county's population was rural, it was assumed 20 percent of the VMT were rural). Emissions were then calculated by taking the product of the VMT and the standard emission factor [33]. A speed correction factor was applied; average route speeds of 45 mph (rural) and 25 mph (urban) were assumed [2]. The emission factor and speed correction factors that were used are shown below:

TABLE-3-1
AREA SOURCE EMISSION AND SCALE FACTORS
(POUNDS/UNIT ACTIVITY)

Category	Scale Factor	Part	SOx	NOx	HC	CO
Anthracite Coal						
Residential	10	10.0	36.8S	3.0	2.5	90.0
Commercial & Institutional	10	2.0	38.5S	10.0	0.2	6.0
Bituminous Coal						
Residential	10	20.0	38.0S	3.0	20.0	90.0
Commercial & Institutional	10	5.8A	38.0S	9.2	2.0	7.2
Industrial	10	13.0A	38.0S	15.0	1.0	2.0
Distillate Oil						
Residential	10	2.5	144.0S	18.0	1.0	5.0
Commercial & Institutional	10	2.0	144.0S	22.0	1.0	5.0
Industrial	10	2.0	144.0S	22.0	1.0	5.0
Residual Oil						
Commercial & Institutional	10	10S+3	159.0S	60.0	1.0	5.0
Industrial	10	10S+3	159.0S	60.0	1.0	5.0
Natural Gas						
Residential	10	10.0	0.6	80.0	8.0	20.0
Commercial & Institutional	10	10.0	0.6	120.0	8.0	20.0
Industrial	10	10.0	0.6	180.0	3.0	17.0
Evaporation						
Solvent	1	0.0	0.0	0.0	2000	0.0
Gasoline Marketing	100	0.0	0.0	0.0	22.0	0.0
Fugitive Emissions						
Unpaved Roads	1	7100	0.0	0.0	0.0	0.0
Unpaved Airstrips	1	14.2	0.0	0.0	0.0	0.0
Construction	1	24000	0.0	0.0	0.0	0.0
Misc. Wind Erosion	1	*	0.0	0.0	0.0	0.0
Land Tilling	1	*	0.0	0.0	0.0	0.0
Structure Fires	1	108.0	0.2	9.4	28.0	244.
Off Highway						
Gasoline	1	10.7	5.6	122.	344.	3900
Diesel	10	33.3	29.8	369.	40.4	104.
Rail Locomotive	10	25.0	57.0	370.	94.0	130.
Aircraft						
Military	100	19.9	3.8	9.56	46.3	49.7
Civil	10	0.569	0.113	0.514	2.52	14.4
Commercial	10	1.79	2.56	25.2	33.1	68.3
Vessels						
Gasoline	1	0.0	6.3	27.4	931.	2960
Solid Waste Incineration	10	7.0	0.5	2.0	2.0	0.0

A = Fuel ash content

S = Fuel sulfur content

* = varies by county

Source: References [33] and [38]

Emission Factors (grams/mile)			
	LDG	HDG	HDD
PM	0.54	2.91	3.3
SO _x	0.13	0.36	2.8
NO _x	4.9	12.6	20.9
HC	7.1	14.0	4.6
CO	51.8	190.0	28.7

Speed Correction Factor*

	<u>Urban</u>	<u>Rural</u>
PM	1.0	1.0
SO _x	1.0	1.0
NO _x	1.10	1.20
HC	0.89	0.60
CO	0.87	0.45

C. MISCELLANEOUS EMISSIONS

Aside from the five fugitive dust emission sources, all emission factors in Table 2-3 were obtained from AP-42 [33]. The emission factors for unpaved roads, unpaved airstrips, construction, land tilling and wind erosion are presented below.

1. Unpaved Roads

The emission factor that was employed is:

$$EF = 0.49 (s) \frac{S}{30} \frac{d}{365}$$

where

* Ambient temperature assumed to be 65°F

EF = suspendable particulate emission factor (lb/VMT)

s = average roadway silt content (percent)

S = average speed (mph)

d = Number of days with less than 0.01 inches of precipitation annually

0.49 = regression coefficient

A 24 percent silt content [31], a 40 mph average speed [33], and 225 dry days per year [35] are the parameters that were used. Therefore, 9.59 pounds of particulate matter (<30 μ m) per unpaved road VMT is the factor that was employed.

2. Unpaved Airstrips

The emission factor was computed using the equation:

$$EF_a = 2 EF$$

where

EF_a = particulate emission factor (lb/LTO)

EF = unpaved road emission factor (lb/VMT)

This equation was derived from reference [31] and results in an emission factor of 19.2 pounds per LTO cycle.

3. Construction

An emission factor of 15.9 tons per acre per year was employed [31]

4. Land Tilling

The emission factor [31] that was used is

$$EF = \frac{1.1s_2}{(PE/50)}$$

where

EF = particulate emission factor (lb/acre)

S = soil silt content (percent)

PE = Precipitation Evaporation Index

1.1, 50 = regression coefficients

The silt content was approximately 50 percent in all counties [31] while the Precipitation Evaporation index varied by county. The values of this parameter are given in Table 3-2.

5. Miscellaneous Wind Erosion

Unlike the previous fugitive dust sources, there is no generally accepted emission factor for miscellaneous wind erosion. The following equation based solely on theoretical relationships has been proposed [34]:

$$EF = 0.0089 \frac{esVf}{(PE/50)^2}$$

where

EF = emissions of suspended dust (tons/acre/year)

e = soil erodability (tons/acre/year)

s = percent silt content of surface soil

V = mitigative fractional reduction in wind erosion due to vegetative cover

f = fraction of time the wind velocity exceeds threshold value of 12 mph [35]

PE = Thornwait's Precipitation Evaporation index

0.0089 = regression coefficient

This equation was used to compute the emission factor for miscellaneous wind erosion. As the validity of this equation is still under review, the calculated emissions of miscellaneous wind erosion sources should be viewed only as an approximation. It was used in the compilation of this inventory only to gain an understanding of the relative importance of this source in relation to the other sources of particulate matter.

TABLE 3-2
PE INDEX BY COUNTY

County	Precipitation Evaporation Index
Belknap	148
Carroll	150
Cheshire	148
Coos	180
Grafton	167
Hillsborough	148
Merrimack	148
Rockingham	148
Stratford	148
Sullivan	148

Reference: Source [31]

IV. GRID SYSTEM DEVELOPMENT AND APPORTIONMENT METHODOLOGY

The counties of Stratford, Merrimack, Rockingham, and Hillsborough, located in southeastern New Hampshire, plus the town of Berlin were overlaid with a grid system to allow for allocation of emissions to sub-county areas. This task was performed so that potential problems with maintenance of air quality standards can be assessed through the use of the gridded emission inventory used in conjunction with air quality simulation models.

A. GRID SYSTEM DEVELOPMENT

A grid system was developed according to standard procedures [43] which can be readily used by standard air quality simulation models. The requirements for the system were that each grid element was square and that the side length of each element had to be an integer-multiple of some basic side length. In this study one kilometer was chosen as the basic side length.

To create the grid system, the entire four-county area was divided into 8-by-8 kilometer grids, each grid being defined by the UTM coordinates of its southwest corner. Approximately 160 such grids were required to define the area.

Each of the 8-by-8 grids was then divided into smaller grids (one, two, or four kilometers on a side) based on the population/municipal density apparent on USGS maps. Those areas with the greatest population density were gridded using one-kilometer grids. In rural areas, the eight-kilometer grids were not subdivided. Each grid was defined by the UTM coordinates of its southwest corner and its size and was assigned an identification number and a county code. Grids which crossed county boundaries were duplicated and assigned a special numeric indicator. These duplicate grids continued to be defined by the same UTM coordinates and size, however, the county codes were different and the percent of the total area of the grid in each county was noted. The portion of any grids lying outside of the four-county area was also noted in developing the grid system.

The final phase of the task involved re-examining each grid to be certain that the proper level of resolution is being displayed. As apportionment factors are available only on the municipal level (except for a very few cities which have sub-municipal population figures), the number of grids was reduced by combining a group of four smaller grids into one larger grid whenever it was apparent that differences in emissions among the smaller grids could not be identified.

The final grid system is composed of 640 grids plus an additional eight for the town of Berlin. The municipalities composing each grid were then identified along with the percentage of the grid which was included in each town. Finally, the entire grid system with all supplementary data were prepared for computer processing.

B. GRID APPORTIONMENT FACTORS

1. Municipal Level Factors

The technique used to apportion county emissions activity among the grids composing that county involved computing a grid activity indicator and then computing the ratio of grid activity-to-county activity. This technique is described mathematically by:

$$E_g = E_c \frac{X_g}{X_c}$$

where

E_g = Grid emissions

E_c = County emissions

X_g = Grid activity indicator

X_c = County activity indicator

The grid activity indicator is computed from municipal activity indicators by means of the following equation:

$$X_{g,j} = A_g \sum_{i=1}^N P_{i,g} D_{i,j}$$

where

- A_g = Area of grid g
- $P_{i,g}$ = Portion of grid g which lies in municipality i
- D_i = Municipal activity indicator density for activity j
- N = Number of municipalities which lie within grid g

Three types of activity indicators were used in this study: population, employment, and inverse population density. Table 4-1 lists the activity indicators used to apportion activity in each of the county emissions sectors to the grid level.

Population and employment density data were readily derived from State sources [41,42]. The third factor, inverse population density, was developed to allow for allocation of emissions, such as those resulting from agricultural activity, which are typically associated with areas of low population density. This factor is defined as:

$$I_k = \frac{\frac{A_k^2}{P_k}}{\sum_{j=1}^N \frac{A_j^2}{P_j}}$$

where

- I_k = Allocation factor for grid k
- A_k = Area of grid k
- P_k = Population of grid k
- N = Number of grids in county which contain grid k

A file was created which contained the three grid apportionment factors and county code associated with each grid.

2. Submunicipal Level Factors

The U.S. Census Bureau reports population data to the sub-municipal "tract" level for five cities in the study area: Nashua, Manchester, Concord, Dover and Portsmouth. Within these cities, the tract

TABLE 4-1
INDICATOR USED FOR AREA SOURCE GRID ALLOCATION

Activity Sector	Grid Activity Indicator
Residential fuel	Population
Commercial fuel	Employment
Industrial fuel	Employment
Incineration	(as above)
Gasoline - Light	Population
- Heavy	Employment
- Off-Highway	Inverse Population Density
Diesel - Heavy	Employment
- Off-Highway	Inverse Population Density
Vessels - Diesel	Employment
- Gasoline	Population
Evaporation - Solvent	Employment
- Gasoline	Sum of gasoline consumption
Forest fires	Inverse Population Density
Structure fires	Population
Land Tilling and Wind Erosion	Inverse Population Density
Aircraft	By inspection
Dirt road travel, dirt air strips and construction	Inverse Population Density

data were used to adjust the population allocation factor to more accurately reflect actual residential distribution. No attempt was made to redistribute employment or inverse population density allocation factors within these cities.

The procedure used to reallocate submunicipal population was similar to that used in the municipal level analysis. Mathematically,

$$x_{g,\text{pop}}^1 = x_{g,\text{pop}} \frac{p_g^1}{p_g}$$

where

$x_{g,\text{pop}}^1$ = Revised grid allocation factor for population

$x_{g,\text{pop}}$ = Grid allocation factor for population computed at the municipal level

p_g^1 = Grid population computed via tract density

p_g = Grid population computed via municipal density

The computed grid populations were developed such that

$$\sum p_g = \sum p_g^1$$

when summed over all grids in the city.

C. ALLOCATION PROCEDURES

To compute total area source emissions associated with each grid, the county emissions by NEDS activity class was multiplied by the appropriate grid allocation factor (Table 4-1) and summed:

$$E_{i,g} = \sum_{N=1}^{51} R_{i,j,n} x_{g,n}$$

where

$E_{i,g}$ = Total emissions of pollutant i in grid g

$R_{i,j,n}$ = Total emissions of pollutant i resulting from activity class n in the county j which includes grid g

$x_{g,n}$ = Allocation factor associated with grid g and activity n

There are 51 NEDS activity classes.

From these data, a gridded inventory of 1975 area source emissions suitable for use by the CDM model was created. Table 4-2 describes the format of this inventory. Two additional fields have been added at the request of the Project Officer. These are the grid number and the particulate emission rate resulting from dirt road travel.

The effective stack height for each area source was an average weighted by the total emissions in four general emissions categories and an average emission height associated with each category [45]. These categories and their associated effective stack heights are:

Category	Effective Stack Height (m)
Residential	13
Commercial	47
Industrial	58
Transportation	4

TABLE 4-2
FORMAT OF GRIDDED AREA SOURCE EMISSION INVENTORY

Column	Format	Description	Units
1-6	I	"X" coordinate	km
7-13	I	"Y" coordinate	km
14-20	I	Size	km
21-28	F	SO ₂ emission rate	g/sec
29-36	F	Particulate emission rate	g/sec
37-44	F	Effective Stack Height	m
69-73	I	Grid Number	-
74-79	F	Particulate emission rate from dirt roads	g/sec

V. PROJECTION METHODOLOGY

To assess the impact of economic and population growth on air quality, the 1975 inventory was projected to 1985. Growth factors were derived from projections made by the Federal Bureau of Economic Analysis (BEA) [46]. In this section, the methodology and growth factors used to project the 1975 New Hampshire emissions are described.

A. GROWTH FACTORS

Using the BEA data, the following 1975-to-1985 growth factors were derived.

Area	Population Growth	Employment Growth
State	1.099	1.213
Manchester SMSA	1.167	1.266
Non-SMSA	1.070	1.190

These data are based on projections made in 1972. Since that time, world economic problems have caused these projections to be in substantial error for certain areas of the U.S. The BEA, however, has recently issued a report [47] in which they attempted to "track" the accuracy of their projections. This report concludes that, for New Hampshire, the BEA projects appear to be essentially correct (2.5 and 0.5 percent deviations for population and earnings).

The BEA defines the Manchester SMSA as Hillsborough County. Hence, the SMSA growth factors were used to project that county and all other areas of the state were projected using the "Non-SMSA" factors. Table 5-1 presents the Growth Factor Category which was applied to each of the NEDS activity classes.

B. PROJECTION METHODOLOGY

1. Activity Projection

Total county activity was projected by activity class using the growth factors described in the previous section. The formula used was:

TABLE 5-1
GROWTH FACTOR CATEGORY USED FOR AREA SOURCE PROJECTION

Activity Sector	Growth Factor Category
Residential fuel	Population
Commercial fuel	Employment
Industrial fuel	Employment
Incineration	(as above)
Gasoline - Light	Population
- Heavy	Employment
- Off-Highway	Population
Diesel - Heavy	Employment
- Off-Highway	Population
- Rail	No growth
Vessels - Diesel	Employment
- Gasoline	Population
Evaporation - Solvent	Employment
- Gasoline	Sum of gasoline consumption
Forest fires	No growth
Structure fires	Population
Land Tilling and Wind Erosion	Agriculture
Aircraft - Military	No growth
- Civil	Population
- Commercial	Population
Dirt road travel, dirt air strips and construction	Population

$$A_{n,85} = A_{n,75} * GF_{n,i}$$

where

$A_{n,85}$ = 1985 County Activity for Class n

$A_{n,75}$ = 1975 County Activity for Class n

$GF_{n,i}$ = Growth factor associated with activity n and county i

In making these projections, two important assumptions were made:

- No substantial redistribution of population or employment centers, and
- Federal fuel conservation programs, particularly those related to motor vehicles, are not implemented.

The latter assumption was specified by the Project Officer to add a degree of conservatism to the projections.

2. Emissions Projections

Emissions resulting from the 1985 county activity inventory were computed identically to those for the 1975 inventory. An exception to this was motor vehicle emissions. Since the Clean Air Act specifies a reduction in emissions from the 1985 vehicle population when compared to vehicles operating in 1975, this reduction is reflected in the emissions projections.

The 1985 motor vehicle emission factors do not, however, reflect the changes in the Clean Air Act enacted in 1977 which extend and/or relax the standards used in the present study. Also, not included are revised vehicle emission rates which are expected to be a part of Supplement 8 of AP-42. These revised emission factors are expected to be higher than those reported in Supplement 5 which were used in this study. Each of these changes suggests that emissions from motor vehicles reported in this study will be underestimated.

The vehicle emission factors used in this study are as follows:

	Emission Rate (gm/mi)				
	PM	SO ₂	NO _x	HC	CO
Light Duty	0.36	0.11	0.83	1.51	7.6
Heavy Duty	2.91	0.36	12.7	8.4	137.6
Heavy Duty Diesel	3.3	2.8	20.1	4.6	28.7

VI. RESULTS

The results of the inventory and projection analyses are reported in Tables 6-1 through 6-6. Table 6-1 presents the 1975 state activity inventory, Table 6-2 presents the 1975 county emission inventory by pollutant, and Table 6-3 presents the state emission inventory by activity class and by pollutant. Tables 6-4 through 6-6 present the corresponding data for 1985. The 1975 gridded emission inventory in CDM format is presented in Appendix A and that for 1985 in Appendix B.

TABLE 6-1

1975 STATE OF NEW HAMPSHIRE AREA SOURCE
ACTIVITY BY EMISSION SOURCE CATEGORY

Residential		
Bituminous Coal	0	Tons
Anthracite Coal	2,910	Tons
Liquified Petroleum Gas and	276,000	Thousand Gallons
Natural Gas	3,880	Million Cubic Feet
Distillate Oil	202,000	Thousand Gallons
Wood	129,600	Tons
Commercial-Institutional		
Bituminous Coal	0	Tons
Anthracite	0	Tons
Liquified Petroleum Gas and	141,000	Thousand Gallons
Natural Gas	2,370	Million Cubic Feet
Distillate Oil	62,900	Thousand Gallons
Residual Oil	3,060	Thousand Gallons
Industrial		
Bituminous Coal	1,400	Tons
Anthracite Coal	0	Tons
Natural Gas and		
Liquified Petroleum Gas	1,320	Million Cubic Feet
Distillate Oil	52,600	Thousand Gallons
Residual Oil	15,410	Thousand Gallons
Wood	288,000	Tons
Transportation		
Highway		
Light Duty Gasoline	340,200	Thousand Gallons
Heavy Duty Gasoline	49,400	Thousand Gallons
Heavy Duty Diesel	19,500	Thousand Gallons
Off-Highway		
Gasoline	25,000	Thousand Gallons
Diesel	18,250	Thousand Gallons
Railroad Diesel	0	Thousand Gallons
Vessel Gasoline	1,370	Thousand Gallons
Vessel Diesel	80	Thousand Gallons
Aircraft LTO Cycles		
Commercial	4,200	Cycles
Civil	184,500	Cycles
Military	27,000	Cycles

TABLE 6-1 (CONTINUED)
1975 STATE OF NEW HAMPSHIRE AREA SOURCE
ACTIVITY BY EMISSION SOURCE CATEGORY

Evaporative Losses		
Retail Gasoline Sales	399,000	Thousand Gallons
Solvent Consumption	38,300	Tons
Miscellaneous		
Dirt Roads Travel	119,000	Thousand VMT
Dirt Air Strip LTO	2,500	Cycles
Construction	4,500	Acres
Wind Erosion	175	Thousand Acres
Land Tilling	240	Thousand Acres
Forest Wildfires	380	Acres
Structure Fires	3,300	Fires
Residential Incineration	6,700	Tons
Industrial Incineration	30,800	Tons
Commercial Incineration	8,400	Tons

TABLE 6-2
1975 NEW HAMPSHIRE COUNTY AREA SOURCE EMISSIONS

County	Particulates (tons/yr)	Sulfur Oxides (tons/yr)	Nitrogen Oxides (tons/yr)	Hydrocarbons (tons/yr)	Carbon Monoxide (tons/yr)
Belknap	60500	553	2230	3690	12600
Carroll	71100	292	2140	2650	9040
Cheshire	110000	852	3950	6670	20900
Coos	86000	284	2570	4070	14800
Grafton	125000	878	3910	6270	21000
Hillsborough	44700	2650	11600	25800	72100
Merrimack	22700	992	4910	9040	28000
Rockingham	37700	1500	8700	14100	49700
Strafford	47000	625	3230	7130	22400
Sullivan	50000	481	2030	3660	11900
State	655000	9107	45300	83100	262000

TABLE 6-3
STATE OF NEW HAMPSHIRE 1975 AREA SOURCE
POLLUTANT EMISSIONS
(TONS/YEAR)

	Particulate Matter	Sulfur Oxides	Nitrogen Oxides	Hydro- Carbons	Carbon Monoxide
FUEL COMBUSTION					
Residential					
Anthracite Coal	14	32	4	4	131
Bituminous Coal	0	0	0	0	0
Distillate Oil	252	2900	1820	101	504
Natural Gas*	19	1	155	15	39
Wood	1620	97	648	1300	1300
Commercial-Institutional					
Bituminous Coal	0	0	0	0	0
Distillate Oil	63	904	692	31	157
Residual Oil	32	438	92	2	8
Natural Gas*	12	1	142	9	24
Industrial					
Bituminous Coal	132	53	11	1	0
Distillate Oil	53	757	578	26	131
Residual Oil	162	2200	462	8	39
Natural Gas*	7	0	119	2	11
Wood	3600	216	1440	2880	2880
Total Fuel Combustion	5,970	7,600	6,160	4,380	5,220
TRANSPORTATION					
Highway					
Light-duty	2750	662	28600	27200	177000
Heavy-duty	537	66	2670	1945	23500
Diesel	354	300	2560	376	2110
Off-Highway					
Gasoline	134	70	1520	4290	48700
Diesel	304	272	3370	369	949
Rail	0	0	0	0	0
Vessel					
Gasoline	0	4	19	637	2030
Diesel	1	1	9	2	3
Aircraft					
Commercial	4	5	53	70	145
Civil	52	10	47	232	1330
Military	270	51	129	625	671
Total Transportation	4410	1440	39000	35700	256000
MISCELLANEOUS					
Evaporative Losses					
Retail Gasoline	0	0	0	4390	0
Solvent Evaporation**	0	0	0	38300	0
Solid Waste Disposal					
All	264	50	62	400	1130
Fires and Open Burning					
Structure Fires	177	0	15	46	399
Forest Wildfires	39	0	9	55	318
Fugitive					
Dirt Roads	571,000	0	0	0	0
Dirt Airstrips	24	0	0	0	0
Construction	71,500	0	0	0	0
Wind Erosion	67	0	0	0	0
Land Tilling	700	0	0	0	0
Total Miscellaneous	644,000	50	77	43100	1529
STATE TOTAL	654,000	9090	45200	83200	263000

* Includes natural gas and LPG

** Includes point and area source emissions

TABLE 6-4
1985 STATE OF NEW HAMPSHIRE AREA SOURCE
ACTIVITY BY EMISSION SOURCE CATEGORY

Residential		
Bituminous Coal	0	Tons
Anthracite Coal	3,180	Tons
Liquified Petroleum Gas	306,000	Thousand Gallons
Natural Gas	4,300	Million Cubic Feet
Distillate Oil	221,000	Thousand Gallons
Wood	141,000	Tons
Commercial-Institutional		
Bituminous Coal	0	Tons
Anthracite	0	Tons
Liquified Petroleum Gas	171,000	Thousand Gallons
Natural Gas	2,880	Million Cubic Feet
Distillate Oil	76,300	Thousand Gallons
Residual Oil	3,710	Thousand Gallons
Industrial		
Bituminous Coal	1,700	Tons
Anthracite Coal	0	Tons
Natural Gas and		
Liquified Petroleum Gas	1,600	Million Cubic Feet
Distillate Oil	63,900	Thousand Gallons
Residual Oil	18,700	Thousand Gallons
Wood	349,000	Tons
Transportation		
Highway		
Light Duty Gasoline	372,000	Thousand Gallons
Heavy Duty Gasoline	59,700	Thousand Gallons
Heavy Duty Diesel	23,600	Thousand Gallons
Off-Highway		
Gasoline	27,400	Thousand Gallons
Diesel	20,000	Thousand Gallons
Railroad Diesel	0	Thousand Gallons
Vessel Gasoline	1,470	Thousand Gallons
Vessel Diesel	100	Thousand Gallons
Aircraft LTO Cycles		
Commercial	4,850	Cycles
Civil	202,000	Cycles
Military	27,000	Cycles

TABLE 6-4

1985 STATE OF NEW HAMPSHIRE AREA SOURCE
ACTIVITY BY EMISSION SOURCE CATEGORY

Evaporative Losses		
Retail Gasoline Sales	461,000	Thousand Gallons
Solvent Consumption	46,700	Tons
Miscellaneous		
Dirt Roads Travel	128,000	Thousand VMT
Dirt Air Strip LTO	2,840	Cycles
Construction	4,900	Acres
Wind Erosion	177	Thousand Acres
Land Tilling	182	Thousand Acres
Forest Wildfires	379	Acres
Structure Fires	3,600	Fires
Residential Incineration	7,610	Tons
Industrial Incineration	36,900	Tons
Commercial Incineration	10,100	Tons

TABLE 6-5
1985 NEW HAMPSHIRE COUNTY AREA SOURCE EMISSIONS

County	Particulates (tons/yr)	Sulfur Oxides (tons/yr)	Nitrogen Oxides (tons/yr)	Hydrocarbons (tons/yr)	Carbon Monoxide (tons/yr)
Belknap	64700	628	1170	3050	5620
Carroll	76100	324	960	2020	3970
Cheshire	118000	962	2050	5770	8980
Coos	92000	321	1270	3300	6380
Grafton	133000	991	2040	5060	9030
Hillsborough	52000	3220	7070	25000	35600
Merrimack	24200	1110	2640	7730	12300
Rockingham	40200	1660	4400	11100	21700
Strafford	50200	690	1750	6210	9920
Sullivan	53500	544	1100	3160	5260
State	704000	10400	24450	72400	119000
Ratio of State 1985 Emissions to 1975 Emissions	1.075	1.147	0.540	0.871	0.453

TABLE 6-6
STATE OF NEW HAMPSHIRE 1985 AREA SOURCE
POLLUTANT EMISSIONS
(TONS/YEAR)

	Particulate Matter	Sulfur Oxides	Nitrogen Oxides	Hydro- Carbons	Carbon Monoxide
FUEL COMBUSTION					
Residential					
Anthracite Coal	16	35	5	4	143
Bituminous Coal	0	0	0	0	0
Distillate Oil	276	3180	1990	110	552
Natural Gas*	21	1	172	17	43
Wood	1760	106	706	1410	1410
Commercial-Institutional					
Bituminous Coal	0	0	0	0	0
Distillate Oil**	76	1100	840	38	191
Residual Oil**	39	531	111	2	9
Natural Gas*	14	1	173	12	29
Industrial					
Bituminous Coal	161	65	13	1	2
Distillate Oil**	64	920	703	32	160
Residual Oil**	197	2680	562	9	47
Natural Gas*	8	0	143	2	14
Wood	4360	262	1740	3490	3490
Total Fuel Combustion	6990	8880	7160	5120	6090
TRANSPORTATION					
Highway					
Light-duty	2000	612	5300	6330	28400
Heavy-duty	649	80	3250	1410	20600
Diesel	429	364	2990	457	2560
Off-Highway					
Gasoline	147	77	1670	4720	53500
Diesel	334	299	3700	406	1040
Rail	0	0	0	0	0
Vessel					
Gasoline	0	5	20	683	2170
Diesel	1	1	11	3	4
Aircraft					
Commercial	4	6	61	80	166
Civil	58	11	52	255	1460
Military	270	51	129	625	671
Total Transportation	3890	1510	17200	15000	111000
MISCELLANEOUS					
Evaporative Losses					
Retail Gasoline	0	0	0	5070	0
Solvent Evaporation	0	0	0	46700	0
Solid Waste Disposal					
All	309	60	74	458	1290
Fires and Open Burning					
Structure Fires	194	0	17	50	439
Forest Fires	39	0	9	55	318
Fugitive Emissions					
Dirt Roads	613,000	0	0	0	0
Dirt Airstrips	27	0	0	0	0
Construction	78,600	0	0	0	0
Wind Erosion	68	0	0	0	0
Land Tilling	535	0	0	0	0
Total Miscellaneous	693,000	60	100	52300	2050
STATE TOTAL	704,000	10,400	24500	72400	119000

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APPENDIX A
1975 GRIDDED EMISSION INVENTORY
IN CDM FORMAT

264	4826	8	0.09	19.33	28.	0.001	0.213	1	11.1
276	4826	4	0.01	1.00	29.	0.002	0.262	2	0.6
256	4818	4	0.09	2.00	29.	0.002	0.206	3	1.2
264	4818	8	0.23	14.19	29.	0.001	0.218	4	8.2
272	4818	8	0.25	47.37	31.	0.004	0.328	5	27.3
280	4818	8	0.41	26.69	34.	0.083	0.437	6	15.3
320	4818	8	0.13	25.63	25.	0.000	0.131	7	1.2
328	4818	8	0.29	148.54	27.	0.000	0.189	8	76.5
334	4818	8	0.09	15.76	27.	0.002	0.468	9	132.6
252	4810	4	0.11	1.55	21.	0.068	0.773	10	14.0
255	4810	8	0.31	9.86	24.	0.025	0.656	11	0.8
264	4810	8	0.24	26.32	24.	0.004	0.357	12	5.5
272	4810	8	0.24	23.88	28.	0.005	0.418	13	15.1
280	4814	4	0.35	1.41	34.	0.135	0.449	14	13.7
284	4810	4	0.30	1.51	34.	0.108	0.443	15	0.6
286	4816	2	0.12	0.33	34.	0.195	0.446	16	0.7
286	4816	2	0.09	0.26	34.	0.195	0.446	17	0.1
286	4814	2	0.12	0.32	34.	0.195	0.446	18	0.1
286	4812	2	0.12	0.33	34.	0.195	0.446	19	0.1
286	4812	2	0.12	0.33	34.	0.195	0.446	20	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	21	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	22	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	23	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	24	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	25	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	26	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	27	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	28	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	29	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	30	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	31	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	32	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	33	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	34	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	35	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	36	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	37	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	38	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	39	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	40	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	41	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	42	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	43	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	44	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	45	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	46	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	47	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	48	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	49	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	50	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	51	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	52	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	53	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	54	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	55	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	56	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	57	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	58	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	59	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	60	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	61	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	62	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	63	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	64	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	65	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	66	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	67	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	68	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	69	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	70	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	71	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	72	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	73	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	74	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	75	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	76	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	77	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	78	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	79	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	80	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	81	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	82	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	83	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	84	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	85	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	86	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	87	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	88	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	89	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	90	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	91	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	92	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	93	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	94	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	95	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	96	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	97	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	98	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	99	0.1
286	4810	2	0.12	0.33	34.	0.195	0.446	100	0.1

320	4794	R	0.30	128.2K.	28.	0.001	0.241	74	114.5
326	4794	R	0.78	40.58	28.	0.009	0.535	75	35.8
336	4800	2	0.11	1.13	28.	0.049	0.580	76	0.7
336	4798	2	0.14	0.91	28.	0.078	0.578	77	0.7
336	4796	2	0.14	0.91	28.	0.078	0.578	78	0.7
336	4794	2	0.14	0.91	28.	0.078	0.578	79	0.7
338	4800	2	0.14	0.69	28.	0.078	0.578	80	0.5
340	4800	2	0.10	0.05	28.	0.078	0.578	81	0.0
342	4800	2	0.14	0.91	28.	0.078	0.578	82	0.0
338	4798	2	0.14	0.91	28.	0.078	0.578	89	0.7
340	4798	2	0.14	0.91	28.	0.078	0.578	91	0.7
342	4798	2	0.14	0.91	28.	0.078	0.578	93	0.7
338	4796	2	0.14	0.91	28.	0.078	0.578	101	0.7
340	4796	2	0.14	0.91	28.	0.078	0.578	103	0.7
342	4796	2	0.14	0.91	28.	0.078	0.578	105	0.7
338	4794	2	0.14	0.91	28.	0.078	0.578	113	0.7
340	4794	2	0.14	0.91	28.	0.078	0.578	115	0.7
342	4794	2	0.14	0.91	28.	0.078	0.578	117	0.7
344	4798	2	0.11	0.73	28.	0.078	0.578	119	0.6
344	4794	4	0.40	2.34	26.	0.095	0.624	120	1.8
248	4786	4	0.07	8.70	29.	0.003	0.336	121	5.0
256	4786	R	0.22	27.17	29.	0.004	0.358	12201	15.6
266	4786	R	0.04	1.94	38.	0.006	0.231	12202	0.9
264	4786	R	0.27	16.97	27.	0.010	0.527	123	9.6
272	4786	R	0.31	13.04	25.	0.018	0.607	124	7.3
280	4786	R	1.34	5.24	32.	0.158	0.507	125	2.0
290	4793	1	0.05	0.09	32.	0.316	0.465	128	0.0
291	4793	1	0.05	0.09	32.	0.316	0.465	129	0.0
292	4793	1	0.05	0.09	32.	0.316	0.465	130	0.0
293	4793	1	0.05	0.09	32.	0.316	0.465	131	0.0
298	4792	1	0.20	0.35	32.	0.316	0.465	134	0.1
290	4792	1	0.05	0.09	32.	0.316	0.465	136	0.0
291	4792	1	0.05	0.09	32.	0.316	0.465	137	0.0
292	4792	1	0.05	0.09	32.	0.316	0.465	138	0.0
293	4792	1	0.05	0.09	32.	0.316	0.465	139	0.0
294	4792	1	0.20	0.35	32.	0.316	0.465	140	0.1
291	4791	1	0.05	0.09	32.	0.316	0.465	144	0.0
292	4791	1	0.05	0.09	32.	0.316	0.465	145	0.0
293	4791	1	0.05	0.09	32.	0.316	0.465	146	0.0
294	4791	1	0.05	0.09	32.	0.316	0.465	147	0.0
295	4791	1	0.05	0.09	32.	0.316	0.465	148	0.0
298	4790	1	0.20	0.35	32.	0.316	0.465	149	0.0
290	4790	1	0.05	0.09	32.	0.316	0.465	150	0.1
291	4790	1	0.05	0.09	32.	0.316	0.465	152	0.0
292	4790	1	0.05	0.09	32.	0.316	0.465	153	0.0
293	4790	1	0.05	0.09	32.	0.316	0.465	154	0.0
294	4790	1	0.05	0.09	32.	0.316	0.465	155	0.0
295	4790	1	0.05	0.09	32.	0.316	0.465	156	0.0
299	4789	1	0.05	0.09	32.	0.316	0.465	157	0.0
290	4789	1	0.05	0.09	32.	0.316	0.465	160	0.0
291	4789	1	0.05	0.09	32.	0.316	0.465	161	0.0
292	4789	1	0.05	0.09	32.	0.316	0.465	162	0.0
293	4789	1	0.05	0.09	32.	0.316	0.465	163	0.0
294	4789	1	0.05	0.09	32.	0.316	0.465	164	0.0
295	4789	1	0.05	0.09	32.	0.316	0.465	165	0.0
298	4788	1	0.05	0.09	32.	0.316	0.465	166	0.1
290	4788	1	0.05	0.09	32.	0.316	0.465	168	0.0
291	4788	1	0.05	0.09	32.	0.316	0.465	169	0.0
292	4788	1	0.05	0.09	32.	0.316	0.465	170	0.0
293	4788	1	0.05	0.09	32.	0.316	0.465	171	0.0

294	4788	1	0.05	0.09	33.	0.316	0.465	172	0.0
295	4788	1	0.05	0.09	33.	0.316	0.465	173	0.0
296	4787	1	0.05	0.09	33.	0.316	0.465	176	0.0
297	4787	1	0.05	0.09	33.	0.316	0.465	177	0.0
298	4787	1	0.05	0.09	33.	0.316	0.465	178	0.0
299	4787	1	0.05	0.09	33.	0.316	0.465	179	0.0
300	4786	1	0.05	0.09	33.	0.316	0.465	180	0.0
301	4786	2	0.20	0.35	33.	0.316	0.465	181	0.0
302	4786	1	0.05	0.09	33.	0.316	0.465	182	0.1
303	4786	1	0.05	0.09	33.	0.316	0.465	184	0.0
304	4786	1	0.05	0.09	33.	0.316	0.465	185	0.0
305	4786	1	0.05	0.09	33.	0.316	0.465	186	0.0
306	4786	1	0.05	0.09	33.	0.316	0.465	187	0.0
307	4786	1	0.05	0.09	33.	0.316	0.465	188	0.0
308	4786	4	0.65	1.32	33.	0.278	0.465	189	0.0
309	4789	1	0.05	0.09	33.	0.316	0.465	192	0.3
310	4789	1	0.05	0.09	33.	0.316	0.465	194	0.0
311	4788	1	0.05	0.09	33.	0.316	0.465	196	0.0
312	4787	1	0.05	0.09	33.	0.316	0.465	197	0.0
313	4787	1	0.05	0.09	33.	0.316	0.465	198	0.0
314	4786	1	0.05	0.09	33.	0.316	0.465	199	0.0
315	4786	1	0.05	0.09	33.	0.316	0.465	200	0.0
316	4786	1	0.05	0.09	33.	0.316	0.465	201	0.0
317	4786	1	0.19	0.35	34.	0.287	0.450	202	0.1
318	4786	2	0.16	0.34	35.	0.237	0.423	203	0.1
319	4790	2	0.15	0.25	32.	0.039	0.487	204	1.2
320	4786	4	0.28	1.25	36.	0.079	0.303	205	0.8
321	4786	8	0.34	1.71	24.	0.024	0.648	206	6.3
322	4786	8	0.27	5.67	22.	0.041	0.716	20701	3.1
323	4786	8	0.12	18.77	19.	0.005	0.522	20702	11.6
324	4786	8	0.01	6.75	27.	0.000	0.177	20703	5.0
325	4786	8	0.14	20.58	19.	0.005	0.543	20801	12.8
326	4786	8	0.26	141.65	27.	0.000	0.177	20802	126.5
327	4786	8	0.45	92.59	28.	0.002	0.404	209	82.5
328	4786	8	1.63	18.72	27.	0.045	0.584	210	15.6
329	4792	2	0.16	0.68	22.	0.154	0.747	211	0.5
330	4792	2	0.19	0.54	16.	0.288	0.935	212	0.3
331	4792	2	0.06	0.16	16.	0.288	0.935	215	0.1
332	4790	2	0.18	0.60	20.	0.215	0.812	216	0.4
333	4790	2	0.19	0.54	16.	0.288	0.935	217	0.3
334	4791	2	0.00	0.00	16.	0.288	0.935	220	0.0
335	4790	1	0.19	0.54	16.	0.288	0.935	221	0.3
336	4790	1	0.04	0.13	16.	0.288	0.935	223	0.1
337	4790	1	0.02	0.05	16.	0.288	0.935	224	0.0
338	4788	2	0.19	0.66	25.	0.169	0.654	225	0.5
339	4788	2	0.10	0.56	18.	0.260	0.871	226	0.4
340	4788	2	0.15	0.60	16.	0.206	0.920	227	0.4
341	4788	2	0.09	0.86	18.	0.082	0.869	228	0.5
342	4786	2	0.19	0.60	16.	0.157	0.624	229	0.7
343	4787	2	0.05	0.17	26.	0.157	0.624	230	0.5
344	4787	1	0.04	0.16	22.	0.168	0.745	231	0.1
345	4787	1	0.02	0.25	18.	0.062	0.850	232	0.2
346	4786	1	0.02	0.29	16.	0.044	0.824	233	0.2
347	4786	1	0.05	0.17	26.	0.157	0.624	234	0.1
348	4786	1	0.05	0.17	26.	0.157	0.624	235	0.1
349	4786	1	0.03	0.21	24.	0.086	0.678	236	0.2
350	4786	1	0.02	0.20	19.	0.044	0.824	237	0.2
351	4786	2	0.07	1.14	19.	0.044	0.824	238	1.0
352	4788	2	0.02	0.41	19.	0.044	0.824	239	0.3

352	4786	2	0.06	1.06	102	0.044	0.824	240	0.9
252	4782	4	0.18	8.00	38.	0.006	0.231	241	3.6
256	4778	4	0.18	39.64	27.	0.000	0.079	242	19.4
264	4778	8	0.00	31.90	38.	0.003	0.231	24301	15.3
264	4778	8	0.16	7.11	29.	0.006	0.231	24401	0.2
264	4778	8	0.27	8.39	38.	0.004	0.116	24402	3.4
272	4778	8	0.10	3.63	44.	0.031	0.684	24501	4.7
280	4778	8	0.14	9.01	23.	0.060	0.539	24601	1.7
280	4778	8	0.60	4.86	44.	0.316	0.465	24602	5.0
288	4784	2	0.20	0.35	30.	0.316	0.465	247	2.3
290	4785	2	0.05	0.09	33.	0.316	0.465	248	0.1
291	4785	1	0.05	0.09	33.	0.316	0.465	249	0.0
292	4785	1	0.05	0.09	33.	0.316	0.465	250	0.0
293	4785	1	0.05	0.09	33.	0.316	0.465	251	0.0
294	4785	1	0.05	0.09	33.	0.316	0.465	252	0.0
295	4785	1	0.05	0.09	33.	0.316	0.465	253	0.0
299	4784	1	0.05	0.09	33.	0.316	0.465	254	0.0
291	4784	1	0.05	0.09	33.	0.316	0.465	255	0.0
292	4784	1	0.05	0.09	33.	0.316	0.465	256	0.0
293	4784	1	0.05	0.09	33.	0.316	0.465	257	0.0
294	4784	1	0.05	0.09	33.	0.316	0.465	258	0.0
295	4784	1	0.05	0.09	33.	0.316	0.465	259	0.0
292	4782	1	0.18	0.34	33.	0.302	0.469	260	0.1
293	4783	1	0.05	0.09	33.	0.316	0.465	263	0.0
294	4783	1	0.05	0.09	33.	0.316	0.465	264	0.0
295	4783	1	0.05	0.09	33.	0.316	0.465	265	0.0
290	4782	1	0.20	0.35	33.	0.316	0.465	266	0.0
292	4782	1	0.05	0.09	33.	0.316	0.465	267	0.1
293	4782	1	0.05	0.09	33.	0.316	0.465	269	0.0
294	4782	1	0.03	0.08	36.	0.152	0.381	270	0.0
295	4782	1	0.05	0.09	33.	0.316	0.465	271	0.0
298	4780	1	0.37	1.51	33.	0.091	0.331	272	0.0
294	4780	4	0.10	0.42	36.	0.062	0.295	273	0.6
292	4778	2	0.08	0.49	40.	0.062	0.295	274	0.2
294	4778	2	0.08	0.49	40.	0.062	0.295	275	0.2
296	4784	2	0.17	0.34	40.	0.272	0.442	276	0.2
298	4784	2	0.13	0.35	34.	0.178	0.386	277	0.1
296	4782	2	0.17	0.34	36.	0.272	0.442	278	0.1
298	4782	2	0.12	0.38	34.	0.135	0.353	279	0.1
300	4782	2	0.47	1.51	38.	0.118	0.353	280	0.1
296	4780	2	0.11	0.39	37.	0.128	0.353	281	0.5
298	4780	2	0.12	0.38	37.	0.135	0.353	282	0.1
302	4780	2	0.12	0.38	38.	0.062	0.295	283	0.1
296	4778	2	0.08	0.49	40.	0.084	0.317	284	0.1
298	4778	2	0.09	0.44	39.	0.135	0.345	285	0.1
300	4778	2	0.12	0.38	38.	0.129	0.345	286	0.2
302	4778	2	1.12	6.81	36.	0.075	0.376	287	0.2
304	4778	8	0.01	3.51	18.	0.001	0.261	288	0.1
304	4778	8	0.03	1.11	25.	0.002	0.621	289	3.1
312	4778	8	0.32	91.21	14.	0.002	0.314	290	0.6
320	4778	8	0.35	89.39	10.	0.002	0.343	291	55.6
328	4778	8	0.19	73.25	16.	0.001	0.171	299	45.7
336	4782	4	0.24	42.78	27.	0.002	0.467	30001	38.1
			0.11	20.23	27.	0.002	0.460	30002	18.0

340	4782	4	0.24	7.91	27.	0.015	0.573	702	6.9
336	4778	4	0.12	17.40	26.	0.003	0.506	303	15.5
340	4780	2	0.06	2.27	30.	0.011	0.499	304	2.0
342	4778	2	0.06	2.36	30.	0.011	0.487	305	2.1
340	4778	2	0.11	1.27	30.	0.038	0.506	306	1.1
342	4778	2	0.19	0.83	31.	0.000	0.490	307	0.6
344	4784	2	0.19	0.69	26.	0.157	0.624	308	0.5
346	4785	1	0.05	0.17	26.	0.157	0.624	309	0.1
347	4785	1	0.05	0.17	26.	0.157	0.624	310	0.1
348	4785	1	0.05	0.17	26.	0.157	0.624	311	0.2
349	4785	1	0.04	0.20	25.	0.108	0.663	312	0.1
346	4784	1	0.05	0.17	26.	0.157	0.624	313	0.1
347	4784	1	0.05	0.17	26.	0.157	0.624	314	0.1
348	4784	1	0.05	0.17	26.	0.157	0.624	315	0.1
349	4784	1	0.05	0.17	26.	0.157	0.624	316	0.1
350	4784	1	0.14	0.79	25.	0.108	0.664	317	0.6
344	4782	2	0.14	0.85	26.	0.092	0.617	318	0.7
346	4783	1	0.05	0.17	26.	0.157	0.624	319	0.1
347	4783	1	0.05	0.17	26.	0.157	0.624	320	0.1
349	4783	1	0.05	0.17	26.	0.157	0.624	321	0.1
346	4782	1	0.05	0.17	26.	0.157	0.624	322	0.1
347	4782	1	0.05	0.17	26.	0.157	0.624	323	0.1
348	4782	1	0.05	0.17	26.	0.157	0.624	324	0.1
349	4782	1	0.05	0.17	26.	0.157	0.624	325	0.1
344	4780	2	0.19	0.69	26.	0.157	0.624	326	0.1
346	4780	2	0.14	0.85	26.	0.092	0.617	327	0.5
350	4780	2	0.19	0.69	26.	0.157	0.624	328	2.6
344	4778	2	0.14	0.85	26.	0.092	0.617	329	0.5
346	4778	2	0.11	1.23	29.	0.041	0.531	330	0.5
348	4778	2	0.14	0.85	26.	0.157	0.624	331	0.5
350	4778	2	0.14	0.85	26.	0.092	0.617	332	0.7
344	4778	2	0.10	0.60	26.	0.157	0.624	333	1.0
352	4784	2	0.10	1.00	22.	0.063	0.743	334	0.5
352	4782	2	0.19	0.69	26.	0.157	0.624	335	0.8
352	4780	2	0.19	0.69	26.	0.157	0.624	336	0.5
252	4774	4	0.30	84.60	20.	0.000	0.007	337	0.5
252	4770	4	0.16	9.43	30.	0.004	0.186	338	0.5
264	4770	4	0.67	41.48	38.	0.004	0.167	339	41.4
264	4770	4	0.43	67.35	38.	0.001	0.167	340	4.5
272	4770	4	0.01	0.43	24.	0.026	0.662	341	20.0
280	4770	4	1.07	42.63	43.	0.004	0.118	342	22.8
280	4770	4	0.67	23.42	43.	0.004	0.118	343	0.2
284	4770	4	0.10	16.26	29.	0.002	0.271	344	20.4
284	4770	4	0.61	12.20	25.	0.018	0.301	345	11.2
206	4774	4	0.15	0.57	40.	0.100	0.295	346	9.4
300	4774	2	0.37	1.77	39.	0.050	0.311	347	6.7
300	4774	2	0.12	0.30	38.	0.125	0.339	348	0.7
300	4774	2	0.12	0.30	38.	0.122	0.335	349	0.1
302	4774	2	0.12	0.30	38.	0.123	0.338	350	0.1
306	4770	4	0.42	1.61	38.	0.107	0.333	351	0.1
300	4770	4	0.46	1.56	35.	0.123	0.338	352	0.6
304	4770	4	1.17	3.93	34.	0.123	0.337	353	0.6
312	4770	4	0.25	21.74	33.	0.006	0.286	354	1.4
320	4770	4	0.56	65.56	30.	0.004	0.306	355	13.4
324	4770	4	0.43	94.22	24.	0.002	0.276	356	40.6
324	4770	4	0.48	55.52	31.	0.004	0.277	357	58.6
324	4770	4	0.00	12.50	26.	0.003	0.523	358	34.4
								359	11.1

336	4774	4	0.12	16.44	26.	0.003	0.523	360	14.6
340	4776	2	0.14	1.03	30.	0.060	0.502	361	0.6
342	4776	2	0.17	0.83	31.	0.065	0.499	364	0.7
342	4774	2	0.19	0.89	31.	0.065	0.500	366	0.9
336	4770	4	0.09	5.54	24.	0.066	0.521	367	4.6
335	4770	4	0.11	2.29	22.	0.052	0.717	36801	4.9
340	4770	4	0.30	1.33	31.	0.090	0.490	36802	1.3
340	4770	4	0.13	2.37	16.	0.072	0.490	36901	1.0
344	4776	2	0.19	0.83	31.	0.060	0.499	36902	1.4
346	4776	2	0.19	0.83	31.	0.060	0.499	370	0.6
344	4774	2	0.19	0.83	31.	0.060	0.499	371	0.6
345	4774	2	0.19	0.83	31.	0.060	0.499	372	0.6
348	4774	4	0.48	2.26	20.	0.099	0.499	373	0.6
348	4774	4	0.07	5.14	20.	0.106	0.555	37401	1.7
344	4770	4	0.37	1.67	21.	0.060	0.499	37402	3.2
344	4770	4	0.11	2.04	14.	0.065	0.815	37501	1.3
344	4770	4	0.10	0.43	31.	0.099	0.499	37502	1.2
348	4770	4	0.21	13.93	31.	0.004	0.145	37601	0.3
352	4774	4	0.02	3.77	26.	0.157	0.624	37602	8.6
352	4772	2	0.05	1.22	33.	0.047	0.174	37701	0.1
354	4772	2	0.26	0.54	33.	0.047	0.627	37702	2.7
352	4770	2	0.09	0.14	26.	0.610	0.661	378	0.1
354	4772	2	0.33	0.62	26.	0.501	0.639	379	0.1
354	4771	1	0.11	0.18	25.	0.610	0.661	380	0.1
355	4771	1	0.11	0.18	25.	0.610	0.661	381	0.0
356	4771	1	0.11	0.18	25.	0.610	0.661	382	0.0
357	4771	1	0.06	0.00	25.	0.610	0.661	383	0.0
354	4770	1	0.11	0.18	25.	0.610	0.661	384	0.0
355	4770	1	0.11	0.18	25.	0.610	0.661	385	0.0
356	4770	1	0.11	0.18	25.	0.610	0.661	386	0.0
357	4770	1	0.11	0.18	25.	0.610	0.661	387	0.0
357	4770	1	0.14	0.26	25.	0.552	0.666	388	0.0
360	4770	2	0.02	0.06	23.	0.254	0.698	389	0.0
248	4762	2	0.46	28.67	39.	0.003	0.173	390	0.0
256	4762	8	0.70	41.12	38.	0.004	0.185	391	0.0
264	4762	8	0.66	70.68	26.	0.001	0.114	392	13.8
272	4762	8	0.98	49.46	22.	0.003	0.111	393	19.8
280	4766	8	0.48	113.04	42.	0.001	0.008	394	34.4
288	4766	4	0.64	2.39	40.	0.100	0.295	395	23.8
292	4766	4	0.64	2.39	40.	0.100	0.295	397	55.2
292	4764	4	0.16	0.60	40.	0.100	0.295	399	0.9
294	4764	2	0.16	0.60	40.	0.100	0.295	400	0.9
294	4762	2	0.16	0.60	40.	0.100	0.295	401	0.2
294	4763	2	0.04	0.15	40.	0.100	0.295	402	0.2
295	4763	1	0.04	0.15	40.	0.100	0.295	403	0.1
295	4762	1	0.04	0.15	40.	0.100	0.295	404	0.1
296	4768	1	0.06	0.10	40.	0.100	0.295	405	0.1
296	4768	2	0.41	0.47	38.	0.127	0.338	406	0.1
298	4768	2	0.11	0.37	33.	0.521	0.475	40701	0.1
298	4768	2	0.04	0.05	33.	0.520	0.478	40702	0.0
300	4768	2	0.12	0.30	33.	0.123	0.338	40801	0.0
302	4764	2	0.12	0.30	33.	0.123	0.338	40802	0.0
296	4766	2	0.67	0.70	24.	0.408	0.465	409	0.1
298	4767	2	0.01	0.03	24.	0.529	0.478	411	0.0
298	4767	1	0.16	0.18	33.	0.529	0.478	41201	0.0
299	4757	1	0.02	0.07	34.	0.123	0.338	41202	0.0
								41301	0.0

290	4767	1	0.07	0.08	34.	0.529	0.478	41302	0.0
300	4767	1	0.01	0.02	34.	0.123	0.338	41401	0.0
301	4767	1	0.18	0.20	33.	0.529	0.478	41402	0.0
308	4766	1	0.03	0.10	38.	0.123	0.338	415	0.0
301	4766	1	0.22	0.25	33.	0.529	0.478	416	0.0
302	4766	1	0.03	0.10	38.	0.123	0.338	419	0.0
302	4766	2	0.12	0.30	34.	0.123	0.338	420	0.1
296	4765	1	0.04	0.17	41.	0.076	0.261	421	0.1
299	4765	1	0.89	1.01	33.	0.529	0.478	424	0.0
301	4765	1	0.08	0.00	33.	0.529	0.478	42601	0.0
301	4765	1	0.05	0.06	38.	0.123	0.338	42602	0.0
297	4764	1	0.05	0.13	38.	0.162	0.337	427	0.0
299	4764	2	0.89	1.01	33.	0.529	0.478	428	0.0
300	4764	1	0.22	0.25	33.	0.529	0.478	430	0.0
301	4764	1	0.22	0.25	33.	0.529	0.478	431	0.0
302	4764	1	0.22	0.25	33.	0.529	0.478	432	0.0
302	4764	2	0.07	0.23	38.	0.123	0.338	43301	0.1
296	4763	1	0.36	0.40	33.	0.529	0.478	43302	0.0
297	4763	1	0.04	0.15	40.	0.100	0.205	434	0.1
298	4763	1	0.22	0.25	33.	0.529	0.478	435	0.0
299	4763	1	0.22	0.25	33.	0.529	0.478	436	0.0
300	4763	1	0.22	0.25	33.	0.529	0.478	437	0.0
301	4763	1	0.22	0.25	33.	0.529	0.478	438	0.0
302	4763	1	0.22	0.25	33.	0.529	0.478	439	0.0
303	4763	1	0.22	0.25	33.	0.529	0.478	440	0.0
296	4762	1	0.22	0.25	33.	0.529	0.478	441	0.0
297	4762	1	0.04	0.15	40.	0.100	0.205	442	0.1
298	4762	1	0.22	0.25	33.	0.529	0.478	443	0.0
299	4762	1	0.22	0.25	33.	0.529	0.478	444	0.0
300	4762	1	0.22	0.25	33.	0.529	0.478	445	0.0
301	4762	1	0.22	0.25	33.	0.529	0.478	446	0.0
303	4762	1	0.22	0.25	33.	0.529	0.478	447	0.0
304	4766	1	0.22	0.25	33.	0.529	0.478	448	0.0
304	4766	4	0.23	5.78	35.	0.123	0.338	449	0.0
304	4764	4	0.23	10.41	35.	0.009	0.284	45001	0.3
304	4764	2	0.04	0.28	34.	0.123	0.338	45002	3.5
304	4764	2	0.15	0.17	34.	0.529	0.478	451	0.1
304	4764	2	0.01	0.30	35.	0.009	0.284	45201	0.1
304	4764	2	0.06	2.58	35.	0.009	0.284	45202	0.2
305	4763	1	0.22	0.25	33.	0.529	0.478	45203	1.6
305	4762	1	0.22	0.25	33.	0.529	0.478	453	0.0
305	4762	1	0.22	0.25	33.	0.529	0.478	454	0.0
306	4762	1	0.06	2.64	35.	0.009	0.284	455	0.0
308	4762	2	0.23	10.77	35.	0.009	0.284	456	0.0
312	4762	4	0.23	38.00	35.	0.012	0.317	457	1.6
320	4762	4	1.05	29.90	34.	0.019	0.370	459	6.6
328	4762	4	1.05	37.25	36.	0.012	0.206	460	23.1
336	4762	4	1.30	14.52	24.	0.012	0.206	461	18.0
344	4762	4	1.11	27.00	33.	0.024	0.392	462	22.6
352	4768	2	0.30	0.60	25.	0.457	0.633	463	8.0
354	4769	1	0.11	0.14	25.	0.610	0.661	464	16.1
355	4769	1	0.11	0.14	25.	0.610	0.661	465	0.1
356	4769	1	0.11	0.14	25.	0.610	0.661	466	0.0
357	4769	1	0.11	0.14	25.	0.610	0.661	467	0.0
358	4769	1	0.11	0.14	25.	0.610	0.661	468	0.0
359	4769	1	0.11	0.14	25.	0.610	0.661	469	0.0
360	4769	1	0.11	0.14	25.	0.610	0.661	470	0.0
361	4769	1	0.11	0.14	25.	0.610	0.661	471	0.0
362	4769	1	0.11	0.14	25.	0.610	0.661	472	0.0

357	4768	1	0.11	0.18	25.	0.610	0.661	473	0.0
356	4768	2	0.32	0.61	25.	0.497	0.654	474	0.1
352	4766	2	0.24	0.59	26.	0.367	0.617	475	0.2
354	4766	2	0.45	0.72	25.	0.610	0.661	476	0.1
356	4766	2	0.40	0.67	25.	0.572	0.657	477	0.1
358	4766	2	0.13	0.76	28.	0.140	0.571	478	0.4
352	4762	4	0.77	2.45	27.	0.241	0.606	479	0.9
356	4762	4	0.51	3.04	24.	0.140	0.571	480	1.5
360	4766	2	0.14	0.64	24.	0.214	0.675	481	0.3
360	4766	2	0.09	1.03	29.	0.067	0.518	482	0.6
360	4764	2	0.00	1.02	20.	0.003	0.162	483	0.6
248	4754	8	0.32	20.96	39.	0.007	0.232	484	10.1
256	4754	8	0.75	31.16	34.	0.007	0.232	485	14.9
264	4754	8	0.68	49.95	34.	0.003	0.157	486	24.2
272	4754	8	0.74	53.74	39.	0.002	0.134	487	26.0
280	4754	8	1.34	22.01	43.	0.014	0.100	488	10.1
288	4758	4	0.69	2.70	42.	0.076	0.236	489	1.0
292	4760	2	0.17	0.64	41.	0.080	0.246	490	0.2
294	4760	2	0.17	0.66	42.	0.080	0.246	491	0.2
292	4758	2	0.14	0.76	44.	0.058	0.193	492	0.3
294	4758	2	0.18	0.76	44.	0.058	0.193	493	0.3
288	4754	4	0.68	3.06	43.	0.057	0.203	494	1.2
292	4754	4	0.73	3.04	44.	0.058	0.193	497	1.1
296	4761	1	0.05	0.13	38.	0.162	0.337	499	0.0
297	4761	1	0.22	0.25	31.	0.529	0.478	500	0.0
298	4761	1	0.22	0.25	33.	0.529	0.478	501	0.0
299	4761	1	0.22	0.25	33.	0.529	0.478	502	0.0
300	4761	1	0.22	0.25	33.	0.529	0.478	503	0.0
301	4761	1	0.22	0.25	33.	0.529	0.478	504	0.0
302	4761	1	0.22	0.25	33.	0.529	0.478	505	0.0
296	4760	1	0.05	0.10	44.	0.058	0.193	507	0.1
297	4760	1	0.13	0.16	35.	0.439	0.430	508	0.0
298	4760	1	0.22	0.25	33.	0.529	0.478	509	0.0
299	4760	1	0.22	0.25	33.	0.529	0.478	510	0.0
300	4760	1	0.22	0.25	33.	0.529	0.478	511	0.0
301	4760	1	0.22	0.25	33.	0.529	0.478	512	0.0
302	4760	1	0.22	0.25	33.	0.529	0.478	513	0.0
303	4760	1	0.22	0.25	33.	0.529	0.478	514	0.0
296	4759	1	0.05	0.14	44.	0.058	0.193	515	0.1
297	4759	1	0.10	0.14	37.	0.349	0.347	516	0.0
298	4759	1	0.13	0.16	35.	0.439	0.430	517	0.0
299	4759	1	0.22	0.25	33.	0.529	0.478	518	0.0
300	4759	1	0.22	0.25	33.	0.529	0.478	519	0.0
301	4759	1	0.22	0.25	33.	0.529	0.478	520	0.0
302	4759	1	0.22	0.25	33.	0.529	0.478	521	0.0
303	4759	1	0.22	0.25	33.	0.529	0.478	522	0.0
296	4758	1	0.05	0.14	44.	0.058	0.193	523	0.1
297	4758	1	0.05	0.14	44.	0.058	0.193	524	0.1
298	4758	1	0.05	0.14	44.	0.058	0.193	525	0.1
299	4758	1	0.17	0.20	34.	0.489	0.456	526	0.0
300	4758	1	0.22	0.25	33.	0.529	0.478	527	0.0
301	4757	1	0.22	0.25	33.	0.529	0.478	528	0.0
300	4757	1	0.22	0.25	33.	0.529	0.478	529	0.0
301	4757	1	0.22	0.25	33.	0.529	0.478	536	0.0
302	4757	1	0.22	0.25	33.	0.529	0.478	537	0.0
296	4756	2	0.80	1.01	44.	0.058	0.193	539	0.3
295	4756	2	0.18	0.76	44.	0.058	0.193	541	0.3
300	4756	2	0.16	0.76	44.	0.058	0.193	543	0.0
301	4756	1	0.17	0.20	34.	0.489	0.456	544	0.0
			0.22	0.25	33.	0.529	0.478		

324	4746	1.11	17.96	30.	0.045	0.491	632	10.4
336	4746	0.87	25.23	35.	0.017	0.340	633	15.2
344	4746	1.47	7.43	24.	0.196	0.674	634	3.5
352	4752	0.15	0.61	23.	0.252	0.708	635	0.3
256	4738	0.46	70.37	31.	0.001	0.106	636	34.3
264	4738	0.45	34.24	30.	0.006	0.349	637	16.9
272	4738	0.61	14.74	25.	0.032	0.614	638	0.2
280	4744	0.06	0.49	21.	0.128	0.786	639	0.2
284	4744	0.06	0.49	21.	0.128	0.786	644	0.2
286	4744	0.10	0.58	34.	0.053	0.441	646	0.2
288	4744	0.15	0.77	43.	0.054	0.221	648	0.3
282	4742	0.06	0.49	21.	0.128	0.786	649	0.2
284	4742	0.06	0.49	21.	0.128	0.786	650	0.2
286	4742	0.06	0.49	21.	0.128	0.786	651	0.3
288	4738	0.12	0.53	38.	0.079	0.346	652	0.3
284	4738	0.17	3.21	24.	0.042	0.653	653	1.5
286	4738	0.38	2.94	37.	0.050	0.357	654	1.2
288	4738	4.34	7.78	37.	0.260	0.372	655	1.6
296	4742	0.43	2.36	36.	0.091	0.399	656	0.9
300	4742	0.18	2.80	35.	0.032	0.401	65701	1.3
300	4742	0.03	0.25	31.	0.070	0.470	65702	0.1
296	4740	0.45	0.58	35.	0.424	0.439	658	0.1
308	4740	0.24	0.45	35.	0.290	0.430	659	0.1
300	4740	0.09	0.76	37.	0.051	0.358	660	0.3
302	4739	0.13	0.61	39.	0.044	0.323	661	0.2
297	4739	0.18	0.21	34.	0.492	0.455	662	0.0
298	4739	0.18	0.21	34.	0.492	0.455	663	0.0
299	4739	0.18	0.21	34.	0.492	0.455	664	0.0
296	4738	0.18	0.21	34.	0.492	0.455	665	0.0
297	4738	0.18	0.21	34.	0.492	0.455	666	0.0
298	4738	0.18	0.21	34.	0.492	0.455	667	0.0
299	4738	0.18	0.21	34.	0.492	0.455	668	0.0
300	4738	0.17	0.21	34.	0.492	0.455	669	0.0
302	4738	0.17	0.57	39.	0.115	0.310	670	0.2
304	4738	0.55	0.57	39.	0.115	0.310	671	0.2
304	4738	1.15	1.76	39.	0.126	0.467	67201	0.6
312	4738	2.57	14.64	31.	0.054	0.467	67202	8.3
320	4738	2.57	11.64	30.	0.164	0.506	673	5.4
328	4738	2.00	7.54	29.	0.208	0.534	674	3.2
260	4734	0.71	2.85	22.	0.273	0.744	675	1.2
260	4730	0.11	8.76	30.	0.605	0.346	676	4.2
264	4730	0.08	6.57	30.	0.005	0.346	677	3.2
264	4730	0.37	21.22	30.	0.010	0.432	678	10.2
272	4730	0.36	25.18	30.	0.007	0.380	679	12.2
280	4730	0.92	19.23	42.	0.012	0.200	680	9.0
288	4734	0.54	5.60	46.	0.014	0.118	681	2.5
292	4736	0.25	0.52	39.	0.188	0.313	682	0.1
294	4734	0.71	0.83	34.	0.492	0.455	683	0.0
294	4734	0.42	0.57	36.	0.377	0.403	684	0.1
294	4734	0.71	0.83	34.	0.492	0.455	685	0.0
298	4730	2.42	4.55	34.	0.014	0.118	686	2.0
298	4737	0.18	2.81	34.	0.492	0.455	687	0.1
297	4737	0.18	0.21	34.	0.492	0.455	688	0.0
298	4737	0.18	0.21	34.	0.492	0.455	689	0.0
298	4737	0.18	0.21	34.	0.492	0.455	690	0.0
300	4737	0.11	0.14	34.	0.492	0.455	691	0.0
301	4737	0.04	0.14	39.	0.410	0.428	692	0.0
302	4737	0.04	0.14	39.	0.115	0.310	693	0.0
303	4737	0.04	0.14	39.	0.115	0.310	694	0.0
					0.115	0.310	695	0.0

296	4736	1	0.18	0.21	34.	0.492	0.455	696	0.0
297	4736	1	0.18	0.21	34.	0.492	0.455	697	0.0
298	4736	1	0.18	0.21	34.	0.492	0.455	698	0.0
299	4736	1	0.18	0.21	34.	0.492	0.455	699	0.0
300	4736	1	0.04	0.14	30.	0.115	0.310	700	0.0
301	4736	1	0.04	0.14	30.	0.115	0.310	701	0.0
302	4736	1	0.04	0.14	30.	0.115	0.310	702	0.0
303	4736	1	0.04	0.14	30.	0.115	0.310	703	0.0
296	4735	1	0.18	0.21	34.	0.492	0.455	704	0.0
297	4735	1	0.18	0.21	34.	0.492	0.455	705	0.0
298	4735	1	0.18	0.21	34.	0.492	0.455	706	0.0
299	4735	1	0.18	0.21	34.	0.492	0.455	707	0.0
300	4735	1	0.04	0.14	30.	0.115	0.310	708	0.0
301	4735	1	0.04	0.14	30.	0.115	0.310	709	0.0
296	4734	1	0.18	0.21	34.	0.492	0.455	710	0.0
297	4734	1	0.18	0.21	34.	0.492	0.455	711	0.0
298	4734	1	0.18	0.21	34.	0.492	0.455	712	0.0
299	4734	1	0.18	0.21	34.	0.492	0.455	713	0.0
300	4734	1	0.10	0.13	35.	0.377	0.418	714	0.0
301	4734	1	0.04	0.14	30.	0.115	0.310	715	0.2
302	4734	2	0.17	0.57	39.	0.115	0.310	716	0.0
296	4733	1	0.18	0.21	34.	0.492	0.455	717	0.0
297	4733	1	0.18	0.21	34.	0.492	0.455	718	0.0
298	4733	1	0.18	0.21	34.	0.492	0.455	719	0.0
299	4733	1	0.18	0.21	34.	0.492	0.455	720	0.0
296	4732	1	0.18	0.21	34.	0.492	0.455	721	0.0
297	4732	1	0.18	0.21	34.	0.492	0.455	722	0.0
298	4732	1	0.18	0.21	34.	0.492	0.455	723	0.0
299	4732	1	0.18	0.21	34.	0.492	0.455	724	0.1
300	4732	1	0.24	0.44	37.	0.277	0.385	725	0.2
302	4732	2	0.17	0.57	39.	0.115	0.310	726	0.0
296	4730	2	0.64	0.75	34.	0.492	0.455	727	0.0
298	4730	2	0.64	0.75	34.	0.492	0.455	728	0.0
300	4730	2	0.26	0.46	37.	0.277	0.385	729	0.1
302	4730	2	0.17	0.57	39.	0.115	0.310	730	0.2
304	4730	4	2.82	7.42	37.	0.179	0.376	73101	0.2
312	4734	4	0.55	1.16	31.	0.032	0.447	73102	0.7
316	4734	4	0.27	1.03	31.	0.324	0.489	73201	0.2
318	4734	4	0.55	1.03	31.	0.177	0.507	73202	0.5
320	4734	4	1.05	2.12	30.	0.341	0.524	73301	0.0
322	4734	4	0.02	0.03	31.	0.324	0.489	73302	0.1
324	4734	4	0.74	1.07	37.	0.325	0.373	734	0.1
326	4734	2	0.37	0.54	37.	0.325	0.373	735	0.0
328	4734	2	0.22	0.32	37.	0.325	0.373	736	0.0
330	4928	8	2.57	21.45	43.	0.073	0.149	801	13.8
332	4928	4	0.64	5.36	43.	0.073	0.149	802	3.4
334	4928	4	0.64	5.36	43.	0.073	0.149	803	3.4
336	4926	2	0.16	1.34	43.	0.073	0.149	804	0.9
338	4926	2	0.16	1.34	43.	0.073	0.149	805	0.9
340	4924	2	0.16	1.34	43.	0.073	0.149	806	0.9
342	4924	2	0.16	1.34	43.	0.073	0.149	807	0.9
344	4924	4	0.64	5.36	43.	0.073	0.149	808	3.4

APPENDIX B
1985 GRIDDED EMISSION INVENTORY
IN CDM FORMAT

264	4820	8	0.10	20.60	29.	0.001	0.200	1	11.9
272	4826	4	0.01	1.07	30.	0.002	0.245	2	0.6
276	4826	4	0.01	2.14	30.	0.002	0.245	3	1.2
256	4818	8	0.10	15.17	30.	0.002	0.204	4	8.7
264	4818	8	0.20	50.63	29.	0.001	0.306	5	29.2
272	4818	8	0.28	28.52	32.	0.003	0.306	6	16.4
280	4818	8	0.40	2.84	27.	0.000	0.400	7	1.3
320	4818	8	0.15	91.69	28.	0.000	0.123	8	81.3
334	4818	8	0.33	158.89	28.	0.000	0.177	9	141.9
252	4810	4	0.10	16.86	22.	0.002	0.442	10	15.0
256	4810	8	0.12	1.64	22.	0.056	0.751	11	0.9
264	4810	8	0.34	10.50	25.	0.021	0.630	12	5.9
272	4810	8	0.27	28.12	30.	0.004	0.364	13	16.1
280	4814	4	0.27	25.51	29.	0.004	0.393	14	14.6
280	4814	4	0.39	1.50	35.	0.111	0.417	15	0.6
280	4810	4	0.34	1.61	35.	0.069	0.411	16	0.7
284	4810	2	0.13	0.35	35.	0.161	0.414	17	0.1
286	4816	2	0.11	0.28	35.	0.161	0.414	18	0.1
294	4814	2	0.13	0.35	35.	0.161	0.414	23	0.1
284	4814	2	0.13	0.35	35.	0.161	0.414	25	0.1
286	4812	2	0.13	0.35	35.	0.161	0.414	31	0.1
286	4812	2	0.13	0.35	35.	0.161	0.414	33	0.1
294	4810	2	0.13	0.35	35.	0.161	0.414	35	0.1
286	4810	2	0.09	0.36	34.	0.115	0.451	36	0.1
292	4814	4	0.09	0.04	23.	0.037	0.703	36	0.1
288	4812	2	0.01	0.17	23.	0.037	0.703	43	0.0
290	4812	2	0.01	0.28	23.	0.037	0.703	44	0.1
288	4810	2	0.03	0.50	23.	0.037	0.703	45	0.2
290	4810	2	0.03	0.50	23.	0.037	0.703	46	0.3
292	4810	4	0.09	1.78	23.	0.037	0.703	47	0.3
296	4810	4	0.05	0.89	23.	0.037	0.703	48	1.0
320	4810	8	0.25	152.60	27.	0.000	0.123	49	0.5
328	4810	8	0.45	180.29	29.	0.000	0.229	50	136.4
330	4810	8	0.30	52.14	28.	0.002	0.433	51	160.9
258	4802	8	0.17	7.05	26.	0.014	0.570	52	48.5
264	4802	8	0.29	19.93	26.	0.007	0.470	53	4.0
264	4802	8	0.20	31.07	30.	0.003	0.334	54	11.4
272	4302	8	0.20	40.06	30.	0.002	0.263	55	17.6
288	4802	6	0.35	7.18	31.	0.062	0.513	56	23.1
290	4802	6	0.25	13.39	26.	0.016	0.590	57	3.6
304	4802	8	0.05	10.77	27.	0.011	0.533	58	7.5
324	4802	8	0.45	79.14	26.	0.002	0.473	59	9.6
332	4806	4	0.14	10.61	27.	0.003	0.514	60	1.8
336	4802	4	0.45	14.56	26.	0.004	0.552	61	69.7
250	4794	6	0.24	19.80	29.	0.009	0.529	62	14.8
264	4794	8	0.20	32.50	30.	0.002	0.275	63	12.9
280	4794	8	0.26	35.11	30.	0.002	0.243	64	17.5
280	4794	8	0.26	28.81	30.	0.003	0.357	65	18.7
280	4794	8	0.27	25.94	30.	0.004	0.388	66	20.7
288	4794	8	0.34	7.84	34.	0.048	0.883	67	16.5
296	4794	8	1.45	5.09	24.	0.111	0.440	68	14.9
304	4794	8	0.40	12.24	31.	0.019	0.494	69	4.2
312	4794	8	0.36	10.10	24.	0.025	0.654	70	2.4
312	4794	8	0.14	1.65	21.	0.070	0.774	71	6.8
312	4794	8	0.01	4.81	28.	0.000	0.165	72	5.6
								7301	0.9
								7302	4.3

320	4794	9	0.34	137.19	29.	0.000	0.226	74	122.5
328	4794	8	0.80	43.35	29.	0.007	0.505	75	38.3
336	4800	2	0.12	1.20	29.	0.039	0.549	76	1.0
336	4798	2	0.15	0.97	29.	0.062	0.547	77	0.8
336	4796	2	0.15	0.97	29.	0.062	0.547	78	0.8
336	4794	2	0.15	0.97	29.	0.062	0.547	79	0.8
338	4800	2	0.12	0.72	29.	0.062	0.547	80	0.6
340	4800	2	0.01	0.05	29.	0.062	0.547	81	0.0
342	4800	2	0.15	0.97	29.	0.062	0.547	82	0.8
348	4798	2	0.15	0.97	29.	0.062	0.547	89	0.8
340	4798	2	0.15	0.97	29.	0.062	0.547	91	0.8
342	4798	2	0.15	0.97	29.	0.062	0.547	93	0.8
358	4796	2	0.15	0.97	29.	0.062	0.547	101	0.8
340	4796	2	0.15	0.97	29.	0.062	0.547	103	0.8
342	4794	2	0.15	0.97	29.	0.062	0.547	105	0.8
340	4794	2	0.15	0.97	29.	0.062	0.547	115	0.8
342	4794	2	0.15	0.97	29.	0.062	0.547	117	0.8
344	4798	4	0.12	0.97	29.	0.062	0.547	119	0.6
344	4794	4	0.44	2.46	27.	0.076	0.594	120	1.9
248	4796	9	0.07	9.29	30.	0.003	0.315	121	5.3
256	4786	9	0.25	29.03	30.	0.003	0.336	12201	16.7
264	4786	8	0.05	2.26	39.	0.005	0.215	12202	1.1
272	4780	6	0.34	18.11	28.	0.009	0.500	123	10.3
280	4780	8	1.50	5.54	33.	0.131	0.475	124	7.4
290	4793	1	0.06	0.09	35.	0.203	0.433	125	2.2
291	4793	1	0.06	0.09	35.	0.203	0.433	128	0.0
292	4793	1	0.06	0.09	35.	0.203	0.433	129	0.0
293	4793	1	0.06	0.09	35.	0.203	0.433	130	0.0
298	4792	2	0.22	0.37	35.	0.203	0.433	131	0.1
290	4792	1	0.00	0.04	35.	0.203	0.433	136	0.0
291	4792	1	0.00	0.09	35.	0.203	0.433	137	0.0
292	4792	1	0.00	0.09	35.	0.203	0.433	138	0.0
293	4792	1	0.00	0.09	35.	0.203	0.433	139	0.0
294	4792	2	0.22	0.37	35.	0.203	0.433	140	0.1
290	4791	1	0.00	0.09	35.	0.203	0.433	144	0.0
291	4791	1	0.00	0.09	35.	0.203	0.433	145	0.0
293	4791	1	0.00	0.09	35.	0.203	0.433	146	0.0
294	4791	1	0.00	0.09	35.	0.203	0.433	147	0.0
294	4791	1	0.00	0.09	35.	0.203	0.433	148	0.0
295	4791	1	0.00	0.09	35.	0.203	0.433	149	0.0
288	4790	2	0.22	0.37	35.	0.203	0.433	150	0.1
290	4790	1	0.00	0.09	35.	0.203	0.433	152	0.0
291	4790	1	0.00	0.09	35.	0.203	0.433	153	0.0
292	4790	1	0.00	0.09	35.	0.203	0.433	154	0.0
293	4790	1	0.00	0.09	35.	0.203	0.433	155	0.0
295	4790	1	0.00	0.09	35.	0.203	0.433	156	0.0
290	4789	1	0.00	0.09	35.	0.203	0.433	157	0.0
291	4789	1	0.00	0.09	35.	0.203	0.433	160	0.0
292	4789	1	0.00	0.09	35.	0.203	0.433	161	0.0
293	4789	1	0.00	0.09	35.	0.203	0.433	162	0.0
294	4789	1	0.00	0.09	35.	0.203	0.433	163	0.0
295	4789	1	0.00	0.09	35.	0.203	0.433	164	0.0
283	4783	2	0.22	0.37	35.	0.203	0.433	165	0.1
290	4783	1	0.00	0.09	35.	0.203	0.433	166	0.0
291	4783	1	0.00	0.09	35.	0.203	0.433	168	0.0
292	4783	1	0.00	0.09	35.	0.203	0.433	169	0.0
293	4783	1	0.00	0.09	35.	0.203	0.433	170	0.0
293	4783	1	0.00	0.09	35.	0.203	0.433	171	0.0

294	4733	1	0.00	0.09	35.	0.263	0.433	172	0.0
295	4738	1	0.00	0.09	35.	0.263	0.433	173	0.0
296	4743	1	0.00	0.09	35.	0.263	0.433	174	0.0
297	4748	1	0.00	0.09	35.	0.263	0.433	175	0.0
298	4753	1	0.00	0.09	35.	0.263	0.433	176	0.0
299	4758	1	0.00	0.09	35.	0.263	0.433	177	0.0
300	4763	1	0.00	0.09	35.	0.263	0.433	178	0.0
301	4768	1	0.00	0.09	35.	0.263	0.433	179	0.0
302	4773	1	0.00	0.09	35.	0.263	0.433	180	0.0
303	4778	1	0.00	0.09	35.	0.263	0.433	181	0.0
304	4783	1	0.00	0.09	35.	0.263	0.433	182	0.0
305	4788	1	0.00	0.09	35.	0.263	0.433	183	0.0
306	4793	1	0.00	0.09	35.	0.263	0.433	184	0.0
307	4798	1	0.00	0.09	35.	0.263	0.433	185	0.0
308	4803	1	0.00	0.09	35.	0.263	0.433	186	0.0
309	4808	1	0.00	0.09	35.	0.263	0.433	187	0.0
310	4813	1	0.00	0.09	35.	0.263	0.433	188	0.0
311	4818	1	0.00	0.09	35.	0.263	0.433	189	0.0
312	4823	1	0.00	0.09	35.	0.263	0.433	190	0.0
313	4828	1	0.00	0.09	35.	0.263	0.433	191	0.0
314	4833	1	0.00	0.09	35.	0.263	0.433	192	0.0
315	4838	1	0.00	0.09	35.	0.263	0.433	193	0.0
316	4843	1	0.00	0.09	35.	0.263	0.433	194	0.0
317	4848	1	0.00	0.09	35.	0.263	0.433	195	0.0
318	4853	1	0.00	0.09	35.	0.263	0.433	196	0.0
319	4858	1	0.00	0.09	35.	0.263	0.433	197	0.0
320	4863	1	0.00	0.09	35.	0.263	0.433	198	0.0
321	4868	1	0.00	0.09	35.	0.263	0.433	199	0.0
322	4873	1	0.00	0.09	35.	0.263	0.433	200	0.0
323	4878	1	0.00	0.09	35.	0.263	0.433	201	0.0
324	4883	1	0.00	0.09	35.	0.263	0.433	202	0.0
325	4888	1	0.00	0.09	35.	0.263	0.433	203	0.0
326	4893	1	0.00	0.09	35.	0.263	0.433	204	0.0
327	4898	1	0.00	0.09	35.	0.263	0.433	205	0.0
328	4903	1	0.00	0.09	35.	0.263	0.433	206	0.0
329	4908	1	0.00	0.09	35.	0.263	0.433	207	0.0
330	4913	1	0.00	0.09	35.	0.263	0.433	208	0.0
331	4918	1	0.00	0.09	35.	0.263	0.433	209	0.0
332	4923	1	0.00	0.09	35.	0.263	0.433	210	0.0
333	4928	1	0.00	0.09	35.	0.263	0.433	211	0.0
334	4933	1	0.00	0.09	35.	0.263	0.433	212	0.0
335	4938	1	0.00	0.09	35.	0.263	0.433	213	0.0
336	4943	1	0.00	0.09	35.	0.263	0.433	214	0.0
337	4948	1	0.00	0.09	35.	0.263	0.433	215	0.0
338	4953	1	0.00	0.09	35.	0.263	0.433	216	0.0
339	4958	1	0.00	0.09	35.	0.263	0.433	217	0.0
340	4963	1	0.00	0.09	35.	0.263	0.433	218	0.0
341	4968	1	0.00	0.09	35.	0.263	0.433	219	0.0
342	4973	1	0.00	0.09	35.	0.263	0.433	220	0.0
343	4978	1	0.00	0.09	35.	0.263	0.433	221	0.0
344	4983	1	0.00	0.09	35.	0.263	0.433	222	0.0
345	4988	1	0.00	0.09	35.	0.263	0.433	223	0.0
346	4993	1	0.00	0.09	35.	0.263	0.433	224	0.0
347	4998	1	0.00	0.09	35.	0.263	0.433	225	0.0
348	5003	1	0.00	0.09	35.	0.263	0.433	226	0.0
349	5008	1	0.00	0.09	35.	0.263	0.433	227	0.0
350	5013	1	0.00	0.09	35.	0.263	0.433	228	0.0
351	5018	1	0.00	0.09	35.	0.263	0.433	229	0.0
352	5023	1	0.00	0.09	35.	0.263	0.433	230	0.0
353	5028	1	0.00	0.09	35.	0.263	0.433	231	0.0
354	5033	1	0.00	0.09	35.	0.263	0.433	232	0.0
355	5038	1	0.00	0.09	35.	0.263	0.433	233	0.0
356	5043	1	0.00	0.09	35.	0.263	0.433	234	0.0
357	5048	1	0.00	0.09	35.	0.263	0.433	235	0.0
358	5053	1	0.00	0.09	35.	0.263	0.433	236	0.0
359	5058	1	0.00	0.09	35.	0.263	0.433	237	0.0
360	5063	1	0.00	0.09	35.	0.263	0.433	238	0.0
361	5068	1	0.00	0.09	35.	0.263	0.433	239	0.0
362	5073	1	0.00	0.09	35.	0.263	0.433	240	0.0

340	4732	4	0.20	8.44	28.	0.012	0.543	302	7.4
336	4778	4	0.13	18.61	28.	0.002	0.480	303	16.6
342	4760	2	0.67	2.42	31.	0.009	0.468	304	2.1
340	4778	2	0.06	2.53	31.	0.008	0.457	305	2.2
342	4778	2	0.12	1.36	31.	0.030	0.475	306	1.1
344	4734	2	0.21	0.68	32.	0.079	0.467	307	0.7
346	4785	2	0.05	0.18	27.	0.127	0.594	308	0.5
347	4785	1	0.05	0.16	27.	0.127	0.594	309	0.1
348	4785	1	0.05	0.16	27.	0.127	0.594	310	0.1
349	4785	1	0.05	0.21	26.	0.127	0.594	311	0.1
346	4784	1	0.05	0.16	27.	0.086	0.635	312	0.2
347	4784	1	0.05	0.16	27.	0.127	0.594	313	0.1
348	4784	1	0.05	0.16	27.	0.127	0.594	314	0.1
349	4784	1	0.05	0.16	27.	0.127	0.594	315	0.1
350	4784	1	0.05	0.16	27.	0.127	0.594	316	0.1
354	4782	2	0.16	0.83	26.	0.086	0.635	317	0.7
346	4783	2	0.16	0.89	28.	0.074	0.587	318	0.7
347	4783	1	0.05	0.16	27.	0.127	0.594	319	0.1
348	4783	1	0.05	0.16	27.	0.127	0.594	320	0.1
349	4783	1	0.05	0.16	27.	0.127	0.594	321	0.1
346	4782	1	0.05	0.16	27.	0.127	0.594	322	0.1
347	4782	1	0.05	0.16	27.	0.127	0.594	323	0.1
348	4782	1	0.05	0.16	27.	0.127	0.594	324	0.1
349	4782	1	0.05	0.16	27.	0.127	0.594	325	0.1
350	4782	1	0.05	0.16	27.	0.127	0.594	326	0.1
344	4780	2	0.21	0.71	27.	0.005	0.506	327	0.5
346	4780	2	0.16	0.89	28.	0.074	0.587	328	0.7
348	4780	2	0.21	0.71	27.	0.127	0.594	329	0.5
350	4780	2	0.21	0.71	27.	0.127	0.594	330	0.5
344	4778	2	0.16	0.89	28.	0.074	0.587	331	0.7
346	4778	2	0.16	0.89	28.	0.074	0.587	332	0.7
348	4778	2	0.16	0.89	28.	0.074	0.587	333	1.1
350	4778	2	0.16	0.89	28.	0.074	0.587	334	0.7
352	4784	2	0.16	0.89	28.	0.074	0.587	335	0.5
352	4782	2	0.21	0.71	27.	0.127	0.594	336	0.9
352	4780	2	0.21	0.71	27.	0.127	0.594	337	0.5
252	4774	2	0.21	0.71	27.	0.127	0.594	338	0.5
252	4770	4	0.20	98.04	21.	0.000	0.006	339	48.3
256	4770	4	0.20	11.00	39.	0.003	0.172	340	5.3
264	4770	8	0.82	48.37	39.	0.003	0.178	341	23.4
264	4770	8	0.82	78.52	30.	0.001	0.157	342	38.3
264	4770	8	0.82	0.46	25.	0.022	0.636	343	0.3
272	4770	8	0.82	49.74	44.	0.003	0.103	344	23.8
280	4770	8	0.82	27.34	44.	0.003	0.106	345	13.0
280	4770	8	0.82	17.40	30.	0.002	0.254	346	10.0
288	4770	8	0.76	13.16	39.	0.015	0.275	347	7.1
288	4770	8	0.76	0.67	41.	0.081	0.273	348	6.2
296	4774	4	0.45	1.91	40.	0.065	0.284	349	0.8
300	4776	2	0.13	0.42	39.	0.102	0.311	350	0.1
302	4776	2	0.13	0.42	39.	0.102	0.311	351	0.1
300	4774	2	0.13	0.42	39.	0.100	0.310	352	0.1
302	4774	2	0.13	0.42	39.	0.100	0.310	353	0.1
300	4770	4	0.48	1.73	39.	0.087	0.305	354	0.7
300	4770	4	0.48	1.63	39.	0.100	0.310	355	0.6
304	4770	6	1.24	4.25	39.	0.100	0.310	356	0.6
312	4770	6	0.25	23.23	34.	0.004	0.263	357	1.5
320	4770	6	0.25	70.06	31.	0.003	0.284	358	14.4
326	4770	6	0.49	100.75	26.	0.002	0.259	359	43.4
328	4770	6	0.54	59.46	35.	0.003	0.256	360	62.7
328	4770	6	0.54	13.36	27.	0.003	0.497	361	36.8
								362	11.9

330	4774	4	0.13	17.58	27.	0.003	0.497	360	15.6
340	4776	2	0.16	1.09	32.	0.048	0.471	361	0.9
342	4776	2	0.21	0.89	32.	0.079	0.467	364	0.7
340	4774	2	0.19	0.94	32.	0.068	0.466	366	0.7
342	4774	2	0.21	0.88	32.	0.079	0.467	367	0.7
350	4770	4	0.10	5.90	29.	0.000	0.492	36801	5.3
350	4770	4	0.12	2.43	23.	0.044	0.692	36802	1.4
340	4770	4	0.33	1.41	32.	0.079	0.467	36901	1.1
340	4770	4	0.14	2.50	17.	0.060	0.668	36902	1.5
344	4776	2	0.21	0.68	32.	0.079	0.467	370	0.7
346	4776	2	0.21	0.68	32.	0.079	0.467	371	0.7
344	4774	2	0.21	0.88	32.	0.079	0.467	372	0.7
346	4774	2	0.21	0.88	32.	0.079	0.467	373	0.7
348	4774	4	0.54	2.37	30.	0.065	0.523	37401	1.6
346	4774	4	0.08	5.50	39.	0.003	0.157	37402	3.4
344	4770	4	0.42	1.76	32.	0.079	0.467	37501	1.3
344	4770	4	0.11	2.20	19.	0.054	0.797	37502	1.3
348	4770	4	0.11	0.40	32.	0.079	0.467	37601	0.3
348	4770	4	0.24	14.90	39.	0.003	0.168	37602	9.2
352	4774	4	0.03	0.09	27.	0.127	0.594	37701	0.1
352	4774	4	0.06	4.03	39.	0.003	0.157	37702	2.5
352	4772	2	0.11	1.30	34.	0.039	0.384	378	0.7
354	4772	2	0.24	0.55	27.	0.593	0.596	379	0.1
350	4772	2	0.10	0.14	26.	0.552	0.631	380	0.0
352	4770	2	0.30	0.62	27.	0.443	0.608	381	0.1
354	4771	1	0.12	0.18	26.	0.552	0.631	382	0.0
355	4771	1	0.12	0.18	26.	0.552	0.631	383	0.0
356	4771	1	0.12	0.18	26.	0.552	0.631	384	0.0
357	4771	1	0.06	0.09	26.	0.552	0.631	385	0.0
354	4770	1	0.12	0.18	26.	0.552	0.631	386	0.0
355	4770	1	0.12	0.18	26.	0.552	0.631	387	0.0
356	4770	1	0.12	0.18	26.	0.552	0.631	388	0.0
357	4770	1	0.12	0.18	26.	0.552	0.631	389	0.0
358	4770	1	0.12	0.18	26.	0.495	0.630	390	0.0
350	4770	2	0.02	0.06	25.	0.218	0.669	391	0.0
248	4762	8	0.50	33.43	39.	0.003	0.160	392	16.2
256	4762	8	0.06	47.95	39.	0.003	0.173	393	23.1
264	4762	8	0.01	82.42	37.	0.001	0.106	394	40.1
272	4762	8	1.21	57.70	43.	0.002	0.102	395	27.8
288	4760	8	0.74	131.79	23.	0.000	0.093	396	64.4
292	4766	4	0.79	2.77	41.	0.081	0.273	397	1.0
298	4762	4	0.79	2.77	41.	0.081	0.273	398	1.0
292	4764	4	0.20	0.69	41.	0.081	0.273	400	0.2
294	4764	2	0.20	0.69	41.	0.081	0.273	401	0.2
292	4762	2	0.20	0.69	41.	0.081	0.273	402	0.2
294	4763	1	0.03	0.17	41.	0.081	0.273	403	0.1
295	4762	1	0.03	0.17	41.	0.081	0.273	404	0.1
295	4762	1	0.03	0.17	41.	0.081	0.273	405	0.1
290	4766	2	0.07	0.21	39.	0.100	0.310	406	0.1
298	4763	2	0.13	0.51	34.	0.452	0.443	40701	0.1
293	4763	2	0.13	0.40	34.	0.100	0.310	40702	0.0
300	4763	2	0.13	0.66	34.	0.460	0.452	40801	0.1
302	4766	2	0.13	0.42	34.	0.100	0.310	40802	0.0
290	4766	2	0.01	0.42	34.	0.100	0.310	409	0.1
298	4767	2	0.01	0.42	34.	0.100	0.310	410	0.1
298	4767	1	0.19	0.03	34.	0.460	0.452	411	0.0
299	4767	1	0.19	0.03	34.	0.460	0.452	41201	0.0
299	4767	1	0.02	0.07	39.	0.100	0.310	41202	0.0
								41301	0.0

299	4767	1	0.08	0.08	34.	0.460	0.452	41302	0.0
300	4767	1	0.01	0.02	39.	0.100	0.310	41401	0.0
301	4767	1	0.21	0.22	34.	0.460	0.452	41402	0.0
298	4766	1	0.03	0.10	39.	0.100	0.310	415	0.0
299	4766	1	0.27	0.28	34.	0.460	0.452	416	0.0
301	4766	1	0.03	0.10	39.	0.100	0.310	419	0.0
302	4766	2	0.13	0.42	39.	0.100	0.310	420	0.1
296	4765	1	0.03	0.19	42.	0.662	0.241	421	0.1
297	4765	2	1.07	1.16	34.	0.460	0.452	424	0.0
301	4765	1	0.09	0.10	34.	0.460	0.452	42601	0.0
301	4765	1	0.02	0.07	39.	0.100	0.310	42602	0.0
296	4764	1	0.06	0.15	39.	0.133	0.313	427	0.0
297	4764	2	1.07	1.10	34.	0.460	0.452	428	0.0
299	4764	1	0.27	0.28	34.	0.460	0.452	430	0.0
300	4764	1	0.27	0.28	34.	0.460	0.452	431	0.0
301	4764	1	0.27	0.26	34.	0.460	0.452	432	0.0
302	4764	2	0.03	0.25	39.	0.100	0.310	43301	0.1
302	4764	2	0.43	0.44	34.	0.460	0.452	43302	0.0
296	4763	1	0.35	0.17	41.	0.081	0.273	434	0.1
297	4763	1	0.27	0.28	34.	0.460	0.452	435	0.0
298	4763	1	0.27	0.28	34.	0.460	0.452	436	0.0
299	4763	1	0.27	0.28	34.	0.460	0.452	437	0.0
300	4763	1	0.27	0.28	34.	0.460	0.452	438	0.0
301	4763	1	0.27	0.28	34.	0.460	0.452	439	0.0
302	4763	1	0.27	0.28	34.	0.460	0.452	440	0.0
296	4762	1	0.05	0.17	34.	0.460	0.452	441	0.0
297	4762	1	0.27	0.28	34.	0.460	0.452	442	0.1
298	4762	1	0.27	0.28	34.	0.460	0.452	443	0.0
299	4762	1	0.27	0.28	34.	0.460	0.452	444	0.0
300	4762	1	0.27	0.28	34.	0.460	0.452	445	0.0
301	4762	1	0.27	0.28	34.	0.460	0.452	446	0.0
302	4762	1	0.27	0.28	34.	0.460	0.452	447	0.0
303	4762	1	0.27	0.28	34.	0.460	0.452	448	0.0
304	4762	1	0.27	0.28	34.	0.460	0.452	449	0.0
304	4766	4	0.25	0.79	39.	0.100	0.310	45001	0.3
304	4766	4	0.14	6.19	37.	0.007	0.260	45002	3.8
304	4766	4	0.26	11.56	37.	0.007	0.262	451	7.1
304	4764	2	0.16	0.36	39.	0.100	0.310	45201	0.1
304	4764	2	0.16	0.19	34.	0.460	0.452	45202	0.0
304	4764	2	0.01	0.32	37.	0.008	0.263	45203	0.2
304	4763	2	0.07	2.87	37.	0.008	0.263	453	1.3
304	4763	1	0.27	0.28	34.	0.460	0.452	454	0.0
305	4763	1	0.27	0.28	34.	0.460	0.452	455	0.0
304	4762	1	0.27	0.28	34.	0.460	0.452	456	0.0
305	4762	1	0.27	0.28	34.	0.460	0.452	457	0.0
306	4762	2	0.07	2.87	37.	0.008	0.263	458	1.8
306	4762	2	0.26	11.44	37.	0.003	0.263	459	7.0
312	4762	4	0.26	40.61	36.	0.010	0.291	460	24.7
320	4762	8	1.03	31.93	35.	0.016	0.341	461	19.2
328	4762	8	1.19	39.85	37.	0.010	0.271	462	24.2
336	4762	8	1.41	15.33	25.	0.674	0.641	463	8.6
344	4762	8	1.23	26.82	34.	0.020	0.362	464	17.2
352	4769	2	0.32	0.61	27.	0.403	0.602	465	0.2
354	4769	1	0.12	0.18	26.	0.552	0.631	466	0.0
355	4769	1	0.12	0.18	26.	0.552	0.631	467	0.0
357	4769	1	0.12	0.18	26.	0.552	0.631	468	0.0
354	4763	1	0.12	0.18	26.	0.552	0.631	469	0.0
355	4763	1	0.12	0.18	26.	0.552	0.631	470	0.0
356	4768	1	0.12	0.18	26.	0.552	0.631	471	0.0
								472	0.0

357	4768	1	0.12	0.14	26.	0.552	0.631	473	0.0
356	4768	2	0.35	0.61	26.	0.442	0.623	474	0.1
355	4766	2	0.26	0.60	28.	0.319	0.585	475	0.2
354	4766	2	0.49	0.70	26.	0.552	0.631	476	0.1
353	4766	2	0.43	0.66	26.	0.514	0.626	477	0.4
352	4762	2	0.14	0.60	29.	0.118	0.538	478	1.0
351	4762	4	0.35	2.53	29.	0.241	0.574	479	1.6
350	4762	4	0.50	3.19	29.	0.118	0.538	480	0.3
349	4763	2	0.15	0.67	29.	0.163	0.645	481	0.6
348	4766	2	0.16	1.10	31.	0.056	0.485	482	0.6
347	4766	2	0.16	1.10	31.	0.056	0.485	483	0.6
346	4764	2	0.34	24.45	31.	0.003	0.150	484	11.8
345	4754	8	0.91	30.33	39.	0.006	0.215	485	17.4
344	4754	8	0.63	58.25	39.	0.002	0.146	486	28.2
343	4754	8	0.91	62.67	40.	0.002	0.124	487	30.3
342	4754	8	1.56	25.64	43.	0.012	0.174	488	11.8
341	4758	4	0.86	3.15	43.	0.062	0.217	489	1.2
340	4760	2	0.21	0.74	43.	0.070	0.241	490	0.3
339	4760	2	0.21	0.77	43.	0.065	0.226	491	0.3
338	4758	2	0.23	0.89	44.	0.047	0.177	492	0.3
337	4753	2	0.23	0.89	44.	0.047	0.177	493	0.3
336	4754	4	0.84	3.56	44.	0.046	0.186	494	1.4
335	4754	4	0.91	3.56	44.	0.047	0.177	497	1.3
334	4761	1	0.06	0.15	34.	0.133	0.313	499	0.0
333	4761	1	0.27	0.23	34.	0.460	0.452	500	0.0
332	4761	1	0.27	0.26	34.	0.460	0.452	501	0.0
331	4761	1	0.27	0.23	34.	0.460	0.452	502	0.0
330	4761	1	0.27	0.28	34.	0.460	0.452	503	0.0
329	4761	1	0.27	0.28	34.	0.460	0.452	504	0.0
328	4761	1	0.27	0.28	34.	0.460	0.452	505	0.0
327	4760	1	0.00	0.22	34.	0.460	0.452	506	0.0
326	4760	1	0.16	0.13	36.	0.375	0.404	507	0.1
325	4760	1	0.27	0.23	34.	0.460	0.452	508	0.0
324	4760	1	0.27	0.23	34.	0.460	0.452	509	0.0
323	4760	1	0.27	0.23	34.	0.460	0.452	510	0.0
322	4760	1	0.27	0.23	34.	0.460	0.452	511	0.0
321	4760	1	0.27	0.23	34.	0.460	0.452	512	0.0
320	4759	1	0.00	0.15	38.	0.293	0.361	513	0.0
319	4759	1	0.16	0.18	36.	0.375	0.404	514	0.1
318	4759	1	0.27	0.28	34.	0.460	0.452	515	0.0
317	4759	1	0.27	0.28	34.	0.460	0.452	516	0.0
316	4759	1	0.27	0.28	34.	0.460	0.452	517	0.0
315	4759	1	0.27	0.28	34.	0.460	0.452	518	0.0
314	4759	1	0.27	0.28	34.	0.460	0.452	519	0.0
313	4759	1	0.27	0.28	34.	0.460	0.452	520	0.0
312	4759	1	0.27	0.28	34.	0.460	0.452	521	0.0
311	4759	1	0.27	0.28	34.	0.460	0.452	522	0.0
310	4759	1	0.27	0.28	34.	0.460	0.452	523	0.1
309	4759	1	0.27	0.28	34.	0.460	0.452	524	0.1
308	4759	1	0.27	0.28	34.	0.460	0.452	525	0.1
307	4759	1	0.27	0.28	34.	0.460	0.452	526	0.0
306	4759	1	0.27	0.28	34.	0.460	0.452	527	0.0
305	4759	1	0.27	0.28	34.	0.460	0.452	528	0.0
304	4759	1	0.27	0.28	34.	0.460	0.452	529	0.0
303	4759	1	0.27	0.28	34.	0.460	0.452	530	0.0
302	4759	1	0.27	0.28	34.	0.460	0.452	531	0.0
301	4759	1	0.27	0.28	34.	0.460	0.452	532	0.0
300	4759	1	0.27	0.28	34.	0.460	0.452	533	0.0
299	4759	1	0.27	0.28	34.	0.460	0.452	534	0.0
298	4759	1	0.27	0.28	34.	0.460	0.452	535	0.0
297	4759	1	0.27	0.28	34.	0.460	0.452	536	0.0
296	4759	1	0.27	0.28	34.	0.460	0.452	537	0.0
295	4759	1	0.27	0.28	34.	0.460	0.452	538	0.0
294	4759	1	0.27	0.28	34.	0.460	0.452	539	0.0
293	4759	1	0.27	0.28	34.	0.460	0.452	540	0.0
292	4759	1	0.27	0.28	34.	0.460	0.452	541	0.0
291	4759	1	0.27	0.28	34.	0.460	0.452	542	0.0
290	4759	1	0.27	0.28	34.	0.460	0.452	543	0.0
289	4759	1	0.27	0.28	34.	0.460	0.452	544	0.0
288	4759	1	0.27	0.28	34.	0.460	0.452		
287	4759	1	0.27	0.28	34.	0.460	0.452		
286	4759	1	0.27	0.28	34.	0.460	0.452		
285	4759	1	0.27	0.28	34.	0.460	0.452		
284	4759	1	0.27	0.28	34.	0.460	0.452		
283	4759	1	0.27	0.28	34.	0.460	0.452		
282	4759	1	0.27	0.28	34.	0.460	0.452		
281	4759	1	0.27	0.28	34.	0.460	0.452		
280	4759	1	0.27	0.28	34.	0.460	0.452		
279	4759	1	0.27	0.28	34.	0.460	0.452		
278	4759	1	0.27	0.28	34.	0.460	0.452		
277	4759	1	0.27	0.28	34.	0.460	0.452		
276	4759	1	0.27	0.28	34.	0.460	0.452		
275	4759	1	0.27	0.28	34.	0.460	0.452		
274	4759	1	0.27	0.28	34.	0.460	0.452		
273	4759	1	0.27	0.28	34.	0.460	0.452		
272	4759	1	0.27	0.28	34.	0.460	0.452		
271	4759	1	0.27	0.28	34.	0.460	0.452		
270	4759	1	0.27	0.28	34.	0.460	0.452		
269	4759	1	0.27	0.28	34.	0.460	0.452		
268	4759	1	0.27	0.28	34.	0.460	0.452		
267	4759	1	0.27	0.28	34.	0.460	0.452		
266	4759	1	0.27	0.28	34.	0.460	0.452		
265	4759	1	0.27	0.28	34.	0.460	0.452		
264	4759	1	0.27	0.28	34.	0.460	0.452		
263	4759	1	0.27	0.28	34.	0.460	0.452		
262	4759	1	0.27	0.28	34.	0.460	0.452		
261	4759	1	0.27	0.28	34.	0.460	0.452		
260	4759	1	0.27	0.28	34.	0.460	0.452		
259	4759	1	0.27	0.28	34.	0.460	0.452		
258	4759	1	0.27	0.28	34.	0.460	0.452		
257	4759	1	0.27	0.28	34.	0.460	0.452		
256	4759	1	0.27	0.28	34.	0.460	0.452		
255	4759	1	0.27	0.28	34.	0.460	0.452		
254	4759	1	0.27	0.28	34.	0.460	0.452		
253	4759	1	0.27	0.28	34.	0.460	0.452		
252	4759	1	0.27	0.28	34.	0.460	0.452		
251	4759	1	0.27	0.28	34.	0.460	0.452		
250	4759	1	0.27	0.28	34.	0.460	0.452		
249	4759	1	0.27	0.28	34.	0.460	0.452		
248	4759	1	0.27	0.28	34.	0.460	0.452		
247	4759	1	0.27	0.28	34.	0.460	0.452		
246	4759	1	0.27	0.28	34.	0.460	0.452		
245	4759	1	0.27	0.28	34.	0.460	0.452		
244	4759	1	0.27	0.28	34.	0.460	0.452		
243	4759	1	0.27	0.28	34.	0.460	0.452		
242	4759	1	0.27	0.28	34.	0.460	0.452		
241	4759	1	0.27	0.28	34.	0.460	0.452		
240	4759	1	0.27	0.28	34.	0.460	0.452		
239	4759	1	0.27	0.28	34.	0.460	0.452		
238	4759	1	0.27	0.28	34.	0.460	0.452		
237	4759	1	0.27	0.28	34.	0.460	0.452		
236	4759	1	0.27	0.28	34.	0.460	0.452		
235	4759	1	0.27	0.28	34.	0.460	0.452		
234	4759	1	0.27	0.28	34.	0.460	0.452		
233	4759	1	0.27	0.28	34.	0.460	0.452		
232	4759	1	0.27	0.28	34.	0.460	0.452		
231	4759	1	0.27	0.28	34.	0.460	0.452		
230	4759	1	0.27	0.28	34.	0.460	0.452		
229	4759	1	0.27	0.28	34.	0.460	0.452		
228	4759	1	0.27	0.28	34.	0.460	0.452		
227	4759	1	0.27	0.28	34.	0.460	0.452		
226	4759	1	0.27	0.28	34.	0.460	0.452		
225	4759	1	0.27	0.28	34.	0.460	0.452		
224	4759	1	0.27	0.28	34.	0.460	0.452		
223	4759	1	0.27	0.28	34.	0.460	0.452		
222	4759	1	0.27	0.28	34.	0.460	0.452		
221	4759	1	0.27	0.28	34.	0.460	0.452		
220	4759	1	0.27	0.28	34.	0.460	0.452		
219	4759	1	0.27	0.28	34.	0.460	0.452		
218	4759	1	0.27	0.28	34.	0.460	0.452		
217	4759	1	0.27	0.28	34.	0.460	0.452		
216	4759	1	0.27	0.28	34.	0.460	0.452		
215	4759	1	0.27	0.28	34.	0.460	0.452		
214	4759	1	0.27	0.28	34.	0.460	0.452		
213	4759	1	0.27	0.28	34.	0.460	0.452		
212	4759	1	0.27	0.28					

302	4750	1	0.27	0.25	34.	0.460	0.452	545	0.0
303	4756	1	0.27	0.28	34.	0.460	0.452	546	0.0
298	4754	2	0.25	0.29	44.	0.047	0.177	547	0.3
300	4754	2	0.39	0.25	44.	0.047	0.177	548	0.3
302	4754	2	0.05	0.44	30.	0.375	0.404	55301	0.2
304	4754	2	0.17	0.43	32.	0.059	0.438	55302	0.6
304	4754	2	1.16	1.08	32.	0.059	0.438	555	11.3
304	4754	2	3.55	1.95	34.	0.028	0.378	55701	0.1
312	4754	2	1.20	3.55	34.	0.460	0.452	55702	20.6
320	4754	2	1.10	34.14	36.	0.014	0.314	558	26.7
328	4754	2	1.10	43.73	37.	0.608	0.266	559	27.3
336	4754	2	1.12	44.82	37.	0.008	0.255	560	0.8
336	4760	2	0.09	1.31	32.	0.038	0.433	561	0.3
336	4760	2	0.15	0.65	25.	0.199	0.668	566	0.4
340	4760	2	0.15	0.65	25.	0.199	0.668	568	0.7
342	4760	2	0.15	0.65	25.	0.199	0.668	570	0.3
336	4758	2	0.15	1.10	31.	0.049	0.472	571	0.3
338	4758	2	0.15	0.65	25.	0.199	0.668	576	0.3
340	4758	2	0.15	0.65	25.	0.199	0.668	578	0.3
342	4758	2	0.15	0.65	25.	0.201	0.669	580	4.1
336	4754	4	0.37	6.95	35.	0.021	0.359	581	5.0
340	4754	4	0.45	8.36	36.	0.014	0.311	582	2.0
344	4758	4	0.41	4.26	29.	0.033	0.543	583	2.5
344	4758	4	0.41	4.44	30.	0.059	0.492	584	0.3
344	4754	4	0.40	0.66	31.	0.055	0.485	585	0.3
348	4756	2	0.14	0.66	24.	0.207	0.674	586	0.3
350	4756	2	0.14	0.66	24.	0.171	0.645	587	0.3
350	4754	2	0.15	0.66	25.	0.191	0.602	588	0.3
352	4754	2	0.15	0.66	24.	0.217	0.640	589	0.6
356	4758	4	0.40	4.44	31.	0.055	0.485	590	1.4
256	4760	4	0.54	1.10	26.	0.145	0.621	591	23.6
272	4746	4	0.54	22.18	38.	0.016	0.312	592	17.8
280	4746	4	0.54	46.76	35.	0.003	0.221	593	6.8
280	4746	4	1.63	15.66	40.	0.033	0.274	594	3.2
286	4746	4	3.41	5.56	41.	0.094	0.362	595	2.4
296	4746	4	0.26	2.59	32.	0.059	0.438	596	0.3
304	4752	2	0.17	1.64	32.	0.059	0.438	597	0.3
310	4752	2	0.17	0.74	31.	0.146	0.499	59801	1.4
310	4750	2	0.17	0.74	31.	0.146	0.499	59802	2.4
304	4746	2	0.17	4.32	32.	0.059	0.438	600	0.3
308	4746	2	0.17	1.06	31.	0.128	0.490	601	0.3
310	4746	2	0.17	1.06	31.	0.059	0.438	606	0.3
308	4746	2	0.17	1.06	31.	0.137	0.495	610	0.4
312	4746	2	0.17	0.74	31.	0.146	0.499	615	0.6
312	4750	2	0.17	0.74	31.	0.146	0.499	617	0.6
310	4750	2	0.17	3.02	31.	0.146	0.499	619	0.6
312	4750	2	0.17	0.74	31.	0.146	0.499	620	0.4
312	4750	2	0.17	0.74	31.	0.146	0.499	621	0.3
316	4750	2	0.17	0.74	31.	0.146	0.499	622	0.3
312	4750	2	0.17	0.74	31.	0.146	0.499	623	0.3
312	4750	2	0.17	0.74	31.	0.146	0.499	624	1.4
316	4750	2	0.17	0.74	31.	0.146	0.499	625	0.3
312	4750	2	0.17	0.74	31.	0.146	0.499	626	0.3
312	4750	2	0.17	0.74	31.	0.146	0.499	627	0.3
316	4750	2	0.17	0.74	31.	0.146	0.499	628	0.3
316	4750	2	0.17	0.74	31.	0.146	0.499	629	0.3
320	4750	2	0.17	0.74	31.	0.146	0.499	630	1.4
320	4750	2	0.17	0.74	31.	0.146	0.499	631	10.7

326	4746	9	1.23	19.12	31.	0.037	0.459	632	11.1
336	4746	4	0.98	26.95	36.	0.014	0.312	633	16.2
349	4746	2	1.06	7.72	25.	0.167	0.644	634	3.7
352	4752	8	0.16	0.63	24.	0.217	0.680	635	0.3
473d	473d	8	0.35	d2.05	32.	0.001	0.099	636	40.0
264	4738	8	0.54	39.69	31.	0.005	0.330	637	19.3
272	4738	8	0.77	17.10	26.	0.026	0.591	638	6.0
280	4744	2	0.07	0.50	21.	0.107	0.769	639	0.2
232	4744	2	0.07	0.50	21.	0.107	0.769	644	0.2
284	4744	2	0.12	0.57	35.	0.077	0.415	646	0.3
236	4744	2	0.19	0.90	43.	0.044	0.504	648	0.4
280	4742	2	0.07	0.56	21.	0.107	0.769	649	0.2
282	4742	2	0.07	0.56	21.	0.107	0.769	650	0.2
284	4742	2	0.07	0.56	21.	0.107	0.769	651	0.2
286	4742	2	0.14	0.74	39.	0.064	0.322	652	0.3
280	4738	4	0.20	3.72	25.	0.035	0.631	653	1.7
284	4738	4	0.40	3.29	34.	0.048	0.334	654	1.4
288	4738	6	5.29	8.87	38.	0.216	0.347	655	1.9
290	4742	4	0.52	2.73	37.	0.075	0.374	656	1.1
300	4742	4	0.21	3.26	36.	0.026	0.377	65701	1.5
303	4742	2	0.03	0.27	32.	0.059	0.434	65702	0.2
290	4740	2	0.54	0.95	36.	0.362	0.413	658	0.1
290	4740	2	0.25	0.51	36.	0.235	0.404	659	0.1
300	4740	2	0.10	0.88	38.	0.041	0.334	660	0.4
302	4740	2	0.10	0.71	40.	0.072	0.300	661	0.3
296	4739	1	0.22	0.23	35.	0.424	0.428	662	0.0
297	4739	1	0.22	0.23	35.	0.424	0.428	663	0.0
298	4739	1	0.22	0.23	35.	0.424	0.428	664	0.0
299	4739	1	0.22	0.23	35.	0.424	0.428	665	0.0
296	4738	1	0.22	0.23	35.	0.424	0.428	666	0.0
297	4738	1	0.22	0.23	35.	0.424	0.428	667	0.0
298	4738	1	0.22	0.23	35.	0.424	0.428	668	0.0
299	4738	1	0.22	0.23	35.	0.424	0.428	669	0.0
300	4738	1	0.21	0.23	40.	0.094	0.288	670	0.2
302	4738	2	0.21	0.23	40.	0.094	0.288	671	0.2
304	4738	8	0.67	0.66	40.	0.103	0.299	67201	0.7
304	4738	8	1.29	2.03	32.	0.045	0.435	67202	8.9
312	4738	3	2.80	15.57	32.	0.139	0.473	673	5.8
320	4738	3	2.22	12.22	31.	0.176	0.500	674	3.4
328	4738	3	0.77	7.86	23.	0.230	0.718	675	1.3
280	4734	4	0.13	10.21	31.	0.004	0.328	676	5.0
284	4730	4	0.11	7.60	31.	0.004	0.328	677	3.7
284	4730	8	0.45	24.71	30.	0.008	0.411	678	11.9
272	4730	8	0.45	29.34	31.	0.005	0.360	679	14.2
280	4730	6	1.11	22.43	43.	0.010	0.184	680	10.5
288	4734	4	0.57	6.53	46.	0.011	0.168	681	3.0
292	4730	2	0.50	0.99	40.	0.154	0.290	682	0.2
294	4730	2	0.50	0.91	35.	0.424	0.428	683	0.0
294	4734	2	0.51	0.64	37.	0.318	0.577	684	0.1
284	4730	4	0.50	5.32	35.	0.424	0.428	685	0.0
292	4730	4	2.92	3.16	40.	0.011	0.108	686	2.4
296	4737	1	0.27	0.23	35.	0.424	0.428	687	0.1
297	4737	1	0.27	0.23	35.	0.424	0.428	688	0.0
298	4737	1	0.27	0.23	35.	0.424	0.428	689	0.0
299	4737	1	0.27	0.23	35.	0.424	0.428	690	0.0
300	4737	1	0.13	0.16	36.	0.348	0.401	691	0.0
301	4737	1	0.05	0.16	40.	0.094	0.288	692	0.0
302	4737	1	0.05	0.16	40.	0.094	0.288	693	0.1
303	4737	1	0.05	0.16	40.	0.094	0.288	694	0.1
303	4737	1	0.05	0.16	40.	0.094	0.288	695	0.1

296	4736	1	0.22	0.34	0.23	35.	0.424	0.424	0.424	696	0.0
297	4736	1	0.22	0.34	0.23	35.	0.424	0.424	0.424	697	0.0
298	4736	1	0.22	0.34	0.23	35.	0.424	0.424	0.424	698	0.0
299	4736	1	0.22	0.34	0.23	35.	0.424	0.424	0.424	699	0.0
300	4736	1	0.22	0.34	0.23	40.	0.424	0.424	0.424	700	0.0
301	4736	1	0.22	0.34	0.23	40.	0.424	0.424	0.424	701	0.1
302	4736	1	0.22	0.34	0.23	40.	0.424	0.424	0.424	702	0.1
303	4736	1	0.22	0.34	0.23	40.	0.424	0.424	0.424	703	0.1
296	4735	1	0.22	0.34	0.23	35.	0.424	0.424	0.424	704	0.0
297	4735	1	0.22	0.34	0.23	35.	0.424	0.424	0.424	705	0.0
298	4735	1	0.22	0.34	0.23	35.	0.424	0.424	0.424	706	0.0
299	4735	1	0.22	0.34	0.23	35.	0.424	0.424	0.424	707	0.0
300	4735	1	0.22	0.34	0.23	40.	0.424	0.424	0.424	708	0.1
301	4735	1	0.22	0.34	0.23	40.	0.424	0.424	0.424	709	0.1
296	4734	1	0.22	0.34	0.23	35.	0.424	0.424	0.424	710	0.0
297	4734	1	0.22	0.34	0.23	35.	0.424	0.424	0.424	711	0.0
298	4734	1	0.22	0.34	0.23	35.	0.424	0.424	0.424	712	0.0
299	4734	1	0.22	0.34	0.23	35.	0.424	0.424	0.424	713	0.0
300	4734	1	0.22	0.34	0.23	37.	0.424	0.424	0.424	714	0.0
301	4734	1	0.22	0.34	0.23	40.	0.424	0.424	0.424	715	0.1
302	4734	2	0.22	0.34	0.23	40.	0.424	0.424	0.424	716	0.2
296	4733	1	0.22	0.34	0.23	35.	0.424	0.424	0.424	717	0.0
297	4733	1	0.22	0.34	0.23	35.	0.424	0.424	0.424	718	0.0
298	4733	1	0.22	0.34	0.23	35.	0.424	0.424	0.424	719	0.0
299	4733	1	0.22	0.34	0.23	35.	0.424	0.424	0.424	720	0.0
300	4733	1	0.22	0.34	0.23	35.	0.424	0.424	0.424	721	0.0
296	4732	1	0.22	0.34	0.23	35.	0.424	0.424	0.424	722	0.0
297	4732	1	0.22	0.34	0.23	35.	0.424	0.424	0.424	723	0.0
298	4732	1	0.22	0.34	0.23	35.	0.424	0.424	0.424	724	0.0
299	4732	1	0.22	0.34	0.23	36.	0.424	0.424	0.424	725	0.1
300	4732	2	0.22	0.34	0.23	40.	0.424	0.424	0.424	726	0.2
301	4732	2	0.22	0.34	0.23	35.	0.424	0.424	0.424	727	0.0
296	4730	2	0.22	0.34	0.23	35.	0.424	0.424	0.424	728	0.0
297	4730	2	0.22	0.34	0.23	38.	0.424	0.424	0.424	729	0.1
298	4730	2	0.22	0.34	0.23	40.	0.424	0.424	0.424	730	0.2
300	4730	2	0.22	0.34	0.23	38.	0.424	0.424	0.424	73101	2.6
301	4730	2	0.22	0.34	0.23	38.	0.424	0.424	0.424	73102	0.7
302	4730	2	0.22	0.34	0.23	34.	0.424	0.424	0.424	73201	0.3
304	4730	2	0.22	0.34	0.23	32.	0.424	0.424	0.424	73202	0.5
312	4734	4	0.22	0.34	0.23	31.	0.424	0.424	0.424	73301	0.6
316	4734	4	0.22	0.34	0.23	34.	0.424	0.424	0.424	73302	0.0
318	4734	4	0.22	0.34	0.23	36.	0.424	0.424	0.424	734	0.2
320	4734	4	0.22	0.34	0.23	38.	0.424	0.424	0.424	735	0.1
324	4734	4	0.22	0.34	0.23	44.	0.424	0.424	0.424	736	0.1
326	4734	4	0.22	0.34	0.23	44.	0.424	0.424	0.424	801	14.8
328	4734	4	0.22	0.34	0.23	44.	0.424	0.424	0.424	802	3.7
329	4734	4	0.22	0.34	0.23	44.	0.424	0.424	0.424	803	3.7
330	4734	4	0.22	0.34	0.23	44.	0.424	0.424	0.424	804	0.9
331	4734	4	0.22	0.34	0.23	44.	0.424	0.424	0.424	805	0.9
332	4734	4	0.22	0.34	0.23	44.	0.424	0.424	0.424	806	0.9
333	4734	4	0.22	0.34	0.23	44.	0.424	0.424	0.424	807	0.9
334	4734	4	0.22	0.34	0.23	44.	0.424	0.424	0.424	808	3.7